Integrated Resource Inventory
Kimiwan - Winagami Volume I

Alberta
FORESTRY, LANDS AND WILDLIFE
Resource Evaluation
and Planning

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INTEGRATED RESOURCE INVENTORY

FOR THE

KIMIWAN-WINAGAMI STUDY AREA

VOLUME I

by

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EXECUTIVE SUMMARY

The Kimiwan-Winagami study area is located northwest of Lesser Slave Lake and includes the town of McLennan. It encompasses some 550 km^2 of forested and cleared land and water, of which Kimiwan and Winagami Lakes account for nearly 15% of the total area.

An integrated resource inventory was initiated for the area during the spring of 1985 with the intent of collecting, analysing and evaluating data on the natural resources of the area in support of a Regional Integrated Decision (RID). The intent of the RID is to provide an interim decision for the Kimiwan-Winagami planning area pending the initiation of the larger Nampa Subregional Integrated Resource Plan (IRP). This report consists of two volumes: the first deals with background information, land and aquatic classification and evaluations, and the second with the vegetation classification for the study area.

Summary of Ecological Conditions

The vegetation of the Kimiwan-Winagami study area is indicative of the Boreal Mixedwood Ecoregion, (Lower Boreal subzone of Boreal Mixedwood zone). Pure or mixed stands of aspen, white spruce and balsam poplar or Luvisolic soils dominate the upland areas, while black spruce and sedge meadows have developed within depressional terrain on Gleysolic or Fibrisolic soils. Large portions of the Falher Plain, especially in the area round McLennan have been cleared for agricultural purposes. Minor areas with the Bearhead Plain and the

Heart River Upland have been cleared for agriculture. Clear cutting and selective thinning have occurred throughout the area.

Summary of Evaluations

With the exception of organic terrain, most landscapes within the study area are judged to have fair to fairly good arable soils for tilled cropping.

Pure deciduous and coniferous communities have high potential forest productivity, while mixedwood communities are slightly lower. Black spruce communities are judged to have potential forest productivity and other wetland communities such as willow and sedge are rated as non-capable.

Most of the area is rated as moderate quality habitat for moose. Upland areas north of Bearhead Creek and the lands immediately adjacent to Winagami Lake and the dammed portion of the South Heart River are judged to provide the most favorable habitat. Black spruce dominated wetlands are rated low.

Landscapes dominated by deciduous forests are rated as moderate quality habitat for ruffed grouse and low quality habitat for spruce grouse. Treed wetlands are rated as moderate quality for spruce grouse and low quality for ruffed grouse. Conifer dominated landscapes provide the most favorable habitat for spruce grouse.

Wetlands having permanent water bodies surrounded by belts of emergent vegetation and adjacent willow or aspen communities are judged

to provide the most favorable habitat for beaver and muskrat. Upland areas are rated as either low or non-capable depending on the presence or absence of small wetlands, respectively.

The Falher Plain is rated as low for marten, fisher and squirrel habitat due to agricultural clearing and the absence of extensive coniferous communities. The Bearhead Plain and the Heart River Upland provide more suitable habitat for these species. Black spruce dominated wetlands, willow dominated stream channels and Kimiwan and Winagami Lakes are rated as low quality habitat or as non-capable.

Much of the area is rated as moderate to high quality habitat for coyote and lynx.

Potential snag habitat occurs throughout the study area within maturing or overmature forest cover. Because stand history (cutting, fire frequency, age) appears to be an important factor in the creation of snag habitat and appears to vary independently of landscape features, potential snag habitat cannot reliably be associated with any particular landscape.

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PREFACE

The Kimiwan-Winagami Integrated Resource Inventory was initiated in 1985 at the request of the Resource Planning Branch of Resource Evaluation and Planning Division. The purpose of the study was to collect, analyse and evaluate information about the natural resources of the Kimiwan-Winagami area to support a regional integrated decision.

This report provides a general description of the natural resources of the area, a discussion of the inventory methods, detailed information on the physical and biological characteristics of the landscape, and evaluations of individual landscapes for agriculture, forestry and wildlife purposes. The text is accompanied by a 1:100 000 Integrated Resource Inventory map.

This information is intended for use at a scale of 1:100 000. Interpretation of this data at other scales may constitute misuse.

ACKNOWLEDGEMENTS

The integrated resource inventory of the Kimiwan-Winagami study area was conducted by Resource Information Services, Resource Evaluation and Planning Division. Funds for fieldwork and map compilation were provided by Resource Evaluation and Planning Division, Alberta Energy and Natural Resources.

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Cheryl Garbutt, Resource Evaluation and Planning, for her patient and expert typing of the manuscript and extended legend; Cartographic Services, Resource Evaluation and Planning Division, for preparation of maps and figures; Reg Schultz, Kathy Bennett, Harry Archibald and Sudi Kocaoglu for data analyses, field assistance and review; members of the Kimiwan-Winagami planning team (John Brownlee, Tom Cottrell, Knut Moller, Dennis York, Daryl Rollins and Don Baker) for their assistance in evaluations and for providing insight into the planning process; Grant and D.J. Hicks for their hospitality and interest in the project.

1. INTRODUCTION

The Kimiwan-Winagami study area is located northwest of Lesser Slave Lake and includes the town of McLennan (Figures 1 and 2). It encompasses approximately 550 km^2 of forested and cleared land and water, of which Kimiwan and Winagami lakes account for nearly 15% of the total area.

The purpose of the study is to classify the landscape on an ecological basis at a scale of 1:100 000 while providing suitability[1] evaluations for agriculture, forestry and wildlife. This information has been requested by the Regional Resource Management Committee of Peace River to support a local plan.

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[1] Suitability is defined as the appropriateness of a particular land use for a given landscape. Suitability evaluates both the physical limitations of growth and the physical limitations of use.

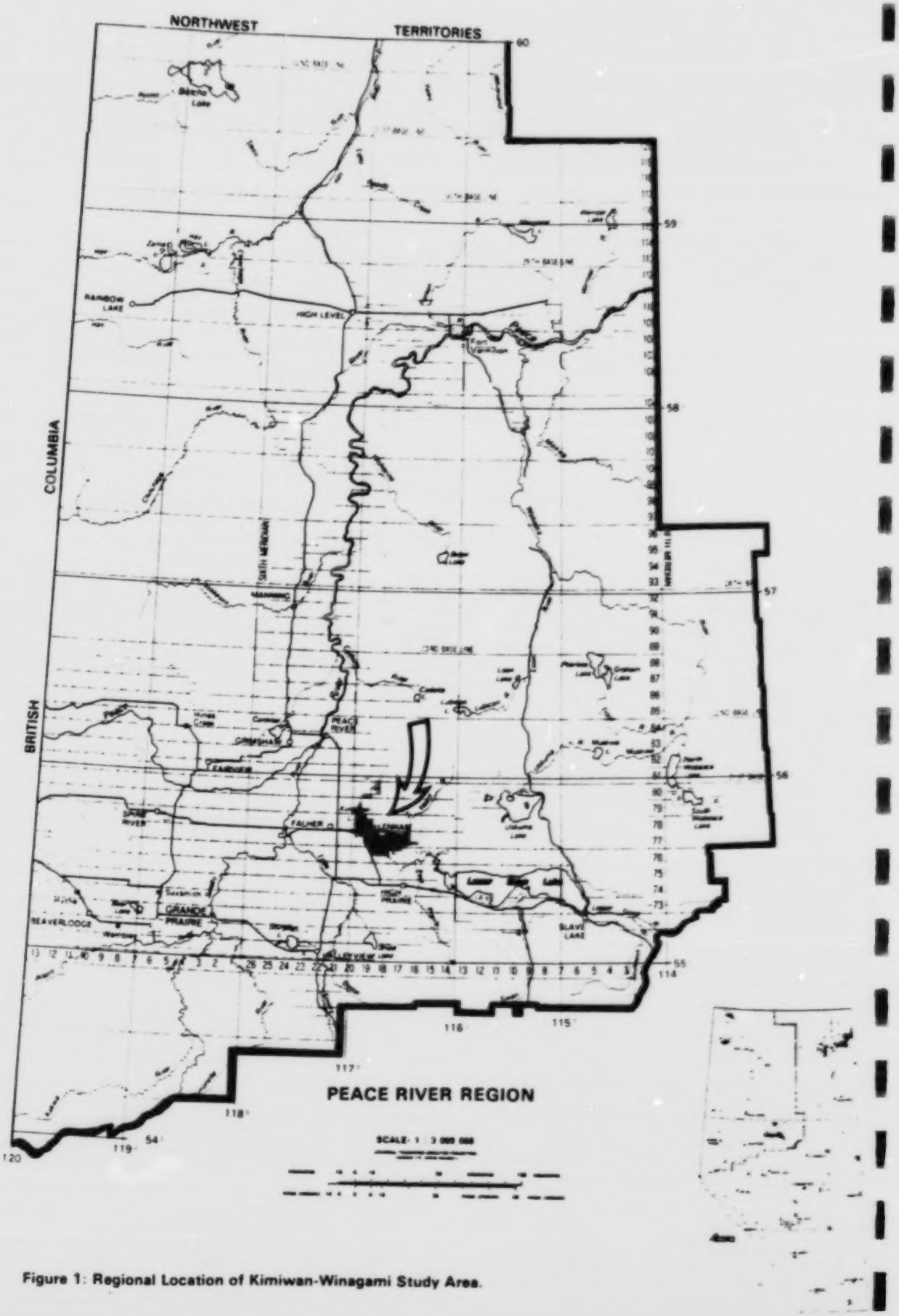


Figure 1: Regional Location of Kimiwan-Winagami Study Area.

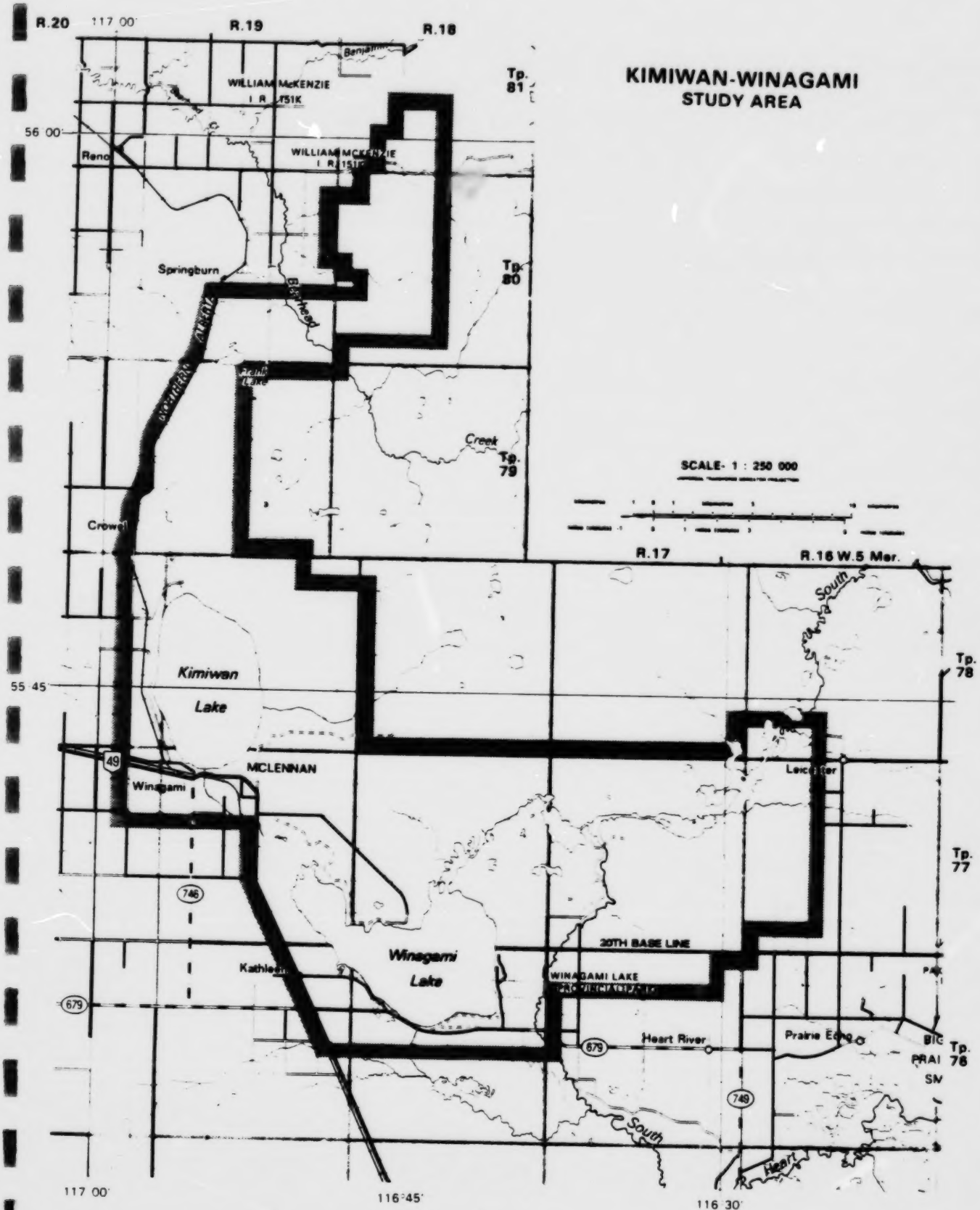


Figure 2: Kimiwan-Winagami Study Area.

2. NATURAL RESOURCES

2.1 Bedrock Geology, Physiography and Surficial Materials

The Kimiwan-Winagami study area occurs within three physiographic districts as defined by Pettapiece (1985); the Falher Plain (FP), Bearhead Plain (BP) and the Heart River Upland (HRU) (Figure 3). These three physiographic districts are all underlain by dark grey shales and silty shales of the Upper Cretaceous Smoky Group.

The Falher Plain occurs below 650 masl and is composed mainly of clay-rich glaciolacustrine materials which blanket morainal materials. Surface expression is level to gently undulating, and "humpy doughnut" topography, characterized by low-relief mounds with slightly depressed centres, is commonly associated with this physiographic district. Organic wetlands are common throughout the Falher Plain, especially in the vicinity of both Kimiwan and Winagami lakes.

The Bearhead Plain, east of the Falher Plain and north of the Heart River Upland, occurs above 650 masl. It is composed of very gently to gently undulating clay-rich till and glaciolacustrine materials. Organic wetland terrain is less extensive than in the Falher Plain and is generally found in association with former meltwater channels and active fluvial systems.

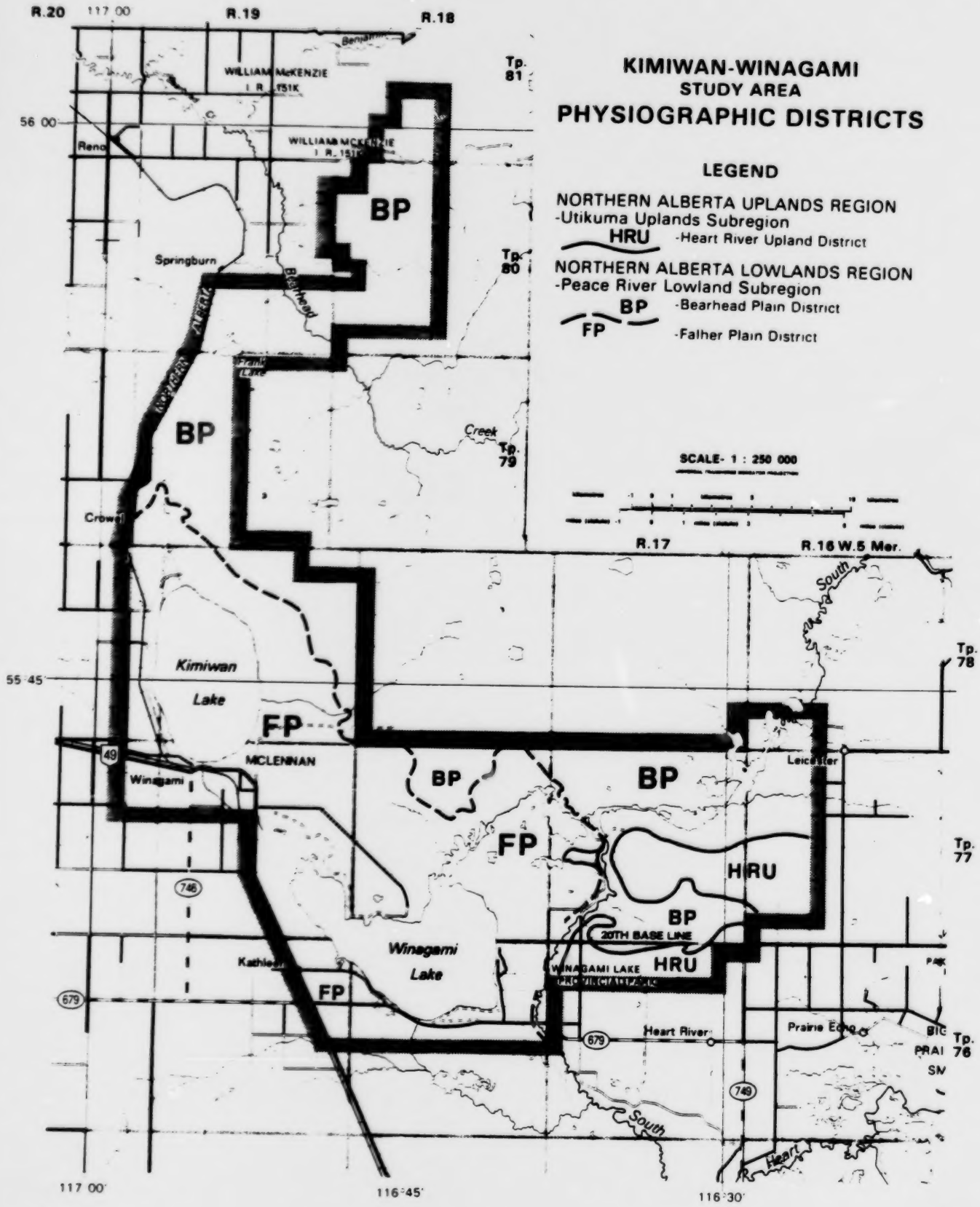


Figure 3: Physiographic Districts of Kimiwan-Winagami Study Area.

The Heart River Upland occurs south and east of the South Heart River and occurs between 620 and 685 masl with the highest elevations occurring in the southeastern corner of the study area. This physiographic district includes mainly undulating to inclined clay-rich till deposits. Below 655 masl, glaciolacustrine veneers commonly overlie these till deposits.

2.2 Vegetation

The vegetation of the Kimiwan-Winagami study area is typical of the Boreal Mixedwood ecoregion as defined by Strong and Leggat (1981). A recent and more detailed classification scheme using a larger soil and vegetation data base (Archibald 1986 in prep.) places the study area within the lower subzone of the Boreal Mixedwood Biogeoclimatic Zone. Pure or mixed stands of aspen, white spruce and balsam poplar dominate the landscape. Common understory species include rose, low-bush cranberry, buffalo-berry, red osier dogwood, bracted honeysuckle, wild sarsaparilla, fireweed and common reedgrass. Feathermosses are commonly found in association with mature white spruce stands. Wetlands support black spruce or sedge meadow communities which have developed together with organic soils.

Upland vegetation has been modified by clearcut or selective logging, domestic grazing and fire, the latter being the predominant form of disturbance.

2.3 Climate

Table 1 presents selected climatic normals for several stations that occur in the vicinity of the Kimiwan-Winagami study area.

Table 1

SELECTED CLIMATIC VARIABLES FOR STATIONS IN THE VICINITY OF THE KIMIWAN-WINAGAMI STUDY AREA (1951-80)[a]

	Elevation (m)	Mean Daily Jan. Temp. (°C)	Mean Daily July Temp. (°C)	Frost Free Period (30 yr. pd.)	Growing Degree Days (May-Sept.)	Total Precipitation (mm)	May to September Precipitation (mm)
Falher	582	-19.1	15.6	107	1 291	450.5	274.0
High Prairie	594	-18.6	15.5	95	1 223	468.1	282.6
McLennan CDA EDP	623	-18.9	15.9	100	1 260	468.7	279.1
Salt Prairie LO	716	M	15.1	100	1 096[2]	M	345.3

[a] Canadian Climate Normals, 1951-80. Environment Canada.
[b] May to September only.

3. METHODS

This section discusses data collection and analysis methods, classification of both terrestrial, fluvial and aquatic landscapes and evaluation methods for till cropping, forestry and wildlife.

3.1 Data Collection and Analysis

A preliminary interpretation of the study area was conducted before the 1985 field season using 1:60 000 black and white panchromatic photos taken in 1981. Preliminary lines were transferred to 1:50 000 NTS map sheets to provide a base for field sampling.

The purpose of the field season was to ground truth the initial interpretation and to collect quantitative information on the soils and vegetation of the study area. Areas to be sampled were originally selected by using aerial photographs in conjunction with the preliminary maps. The actual site locations were chosen using two main criteria; the sites had to be located within these areas in places judged to represent the general environmental conditions and vegetation, and recently disturbed places were to be avoided where possible. Access also played a part in site location, as large portions of the study area were inaccessible by road and provided few places for helicopter landing.

A 10 x 10 m (0.1 ha) plot was established and data on soils, parent materials, vegetation cover, tree mensuration and site conditions were collected as outlined in the Integrated Resource Inventory Site Manual (1984) and in agreement with the Canadian System of Soil Classification (1978). Browse and biomass data were also collected as outlined in the Integrated Resource Inventory Site Manual (1985) and in agreement with the Canadian System of Soil Classification (1978) browse was collected on a subset of plots, and biomass (forb and grass) on all plots. In all, 60 detailed plots were sampled their locations are shown in Figure 4.

The collected data were subsequently summarized and analysed. Preliminary maps and legends were revised to reflect the new information collected. Descriptions of the mapped landscapes are presented in Sections 4.0 and 5.0. Vegetation, mensuration and environment data are summarized in Volume II (Vegetation Classification) and presented in detail in Appendix 1 of the same volume.

3.2 Integrated Land Classification

Integrated land classification is a method of characterizing and understanding landscapes through the systematic examination and synthesis of various landscape features. Soil, environment and vegetation factors are key landscape components which the integrated resource inventory attempts to describe and correlate. As the landscape classification process is somewhat different for terrestrial and aquatic landscapes, each will be discussed separately.

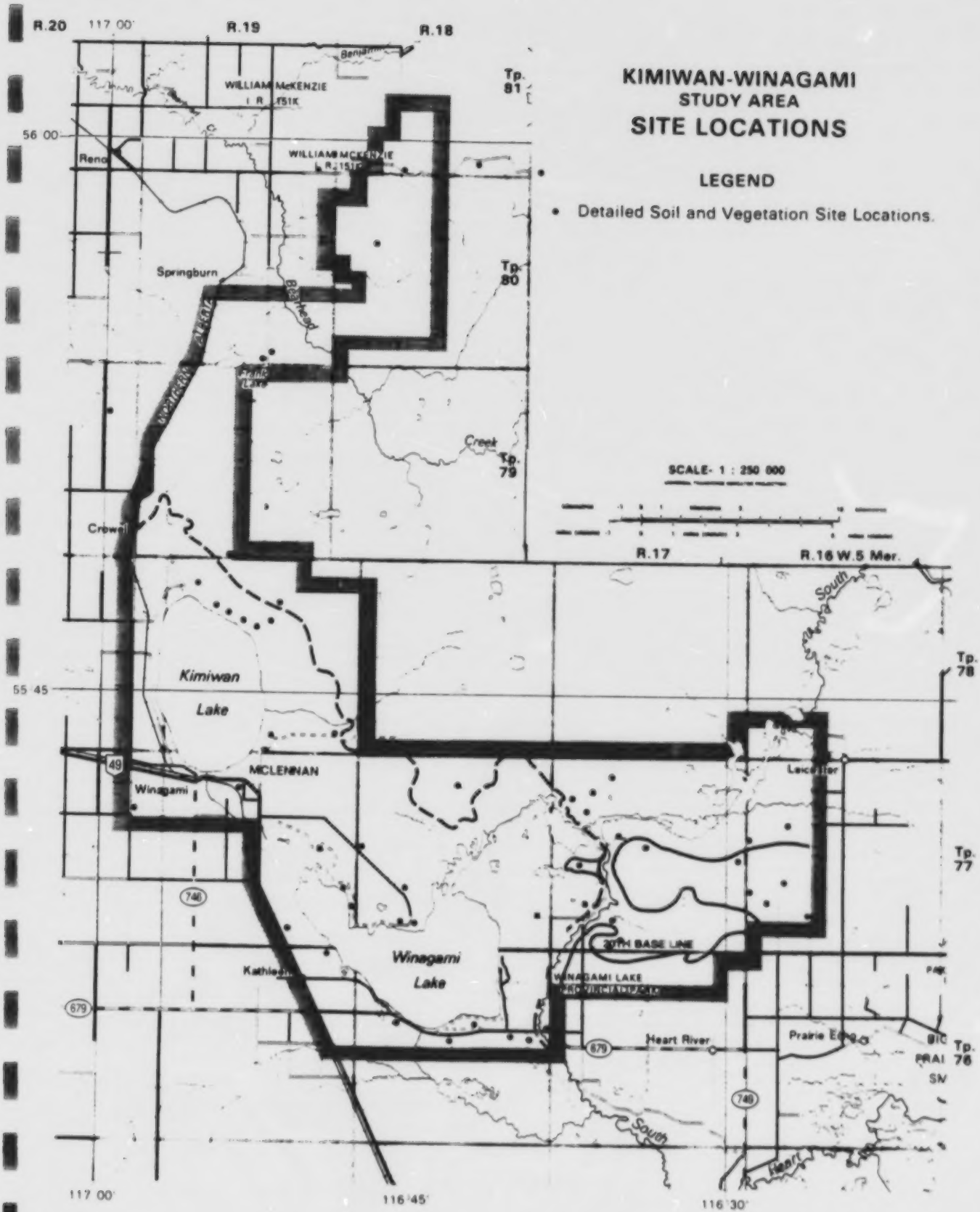


Figure 4: Site Locations in Kimiwan-Winagami Study Area.

3.2.1 Terrestrial Classification

There are three levels in the Integrated Land Classification of terrestrial landforms.

1. Ecoregion

This is the broadest category of land classification and is defined as an area characterized by a distinct regional climate as expressed by vegetation. It is mapped at a scale of 1:1 000 000 to 1:3 000 000. This category of information is not depicted on the Integrated Resource Inventory maps because the entire Kimiwan-Winagami study area occurs within the Boreal Mixedwood Ecoregion.

2. Physiographic District

This level of mapping is based on definite patterns of relief, geology, geomorphology and drainage pattern and density. It is mapped at a scale of 1:1 000 000 to 1:250 000. This category of information is depicted on the Integrated Resource Inventory map.

3. Ecosection

This ecosection is the basic unit of classification and represents a further subdivision of the physiographic district. It is characterized by recurring patterns of slope, landform, soils and vegetation. Ecosections are mapped at a scale of 1:250 000 to 1:100 000 and are depicted on the Integrated Resource Inventory maps.

The mapped information is presented in a closed legend format as follows

HRU.M1, where

HRU	represents the physiographic district, Heart River Uplands.
M	represents the surficial materials, moraine
1	represents the particular ecosection

3.2.2 Fluvial and Aquatic Classification

Fluvial and aquatic ecosections include both river and stream courses and major water bodies such as Kimiwan, Winagami and Frank lakes, respectively. They often transcent physiographic districts with no apparent changes in stream/lake characteristics or morphology. It is for this reason that aquatic landforms have been delineated, classified and mapped independently of physiographic districts. Also, it is easier to evaluate these landscapes in terms of suitability ratings if treated as independent features.

These landforms have been delineated and classified on the basis of valley form, channel morphology, slope, substrate materials, permanency of water body and depth. Information for fluvial and aquatic landforms is presented in the following closed legend format.

F1, where

F represents the geomorphic system aquatic.

F is used for river and stream courses while W is used for large, permanent water bodies

1 represents the particular aquatic ecosection

3.2.3 Vegetation Classification

The vegetation classification program employs three levels of classification to describe vegetation. ecoregion or biogeoclimatic zone, plant associations and plant communities. The plant community is a site specific indication of environmental conditions and stand history as expressed by vegetation. Plant communities with similar vegetation and occurring under similar environmental conditions are grouped into plant associations. Plant associations occurring on modal sites may subsequently be grouped by characteristic species groups, which reflect climatic influence, to define ecoregion or biogeoclimatic zones. Classification is discussed in detail in Volume II of this report.

Plant associations are not mapped individually. However, the dominant plant associations occurring within each ecosection are identified in the description of mapped landscapes (Sections 4.0 and 5.0). The linkage between plant associations and ecosections is developed as follows:

1. Plant associations are defined using both floristic and environmental criteria derived from site data (Volume II).

2. Ecosections are characterized and delineated using environmental criteria from site data.

3. Differences in vegetation physiognomy discernable from 1:60 000 scale panchromatic air photos together with generalized environmental conditions within a particular ecosection are both used to derive the most likely associations and their relative proportion.

In the ecosection descriptions, the references to communities may be equated to associations with the same or similar names described in Volume II. In the interests of brevity, association names have been reduced in cases where the shorter name adequately indicates the assocation.

3.2.4 Landscape Evaluations

Landscape evaluations have been requested for the study area from Alberta Fish and Wildlife, Alberta Forest Service and Public Lands. Individual landscape units have been evaluated for till cropping, forest productivity and for several wildlife species, including moose, spruce grouse, ruffed grouse, beaver, muskrat, lynx, coyote, marten, fisher and squirrel. Snag habitat potential was also evaluated on an individual landscape basis.

Evaluation methods are detailed in Appendix 1 (tilled cropping). Appendix 2 (forest productivity) and Appendix 3 (wildlife).

Appendix 4 is an extended legend for the Kimiwan-Winagami study area. Biophysical attributes and landscape evaluations are presented, as well as estimate of percent occurrence of landform, soils, drainage, pH, texture, plant association and physiognomy. Percent values are very important for determining suitability ratings, particularly where productivity ratings are tied to plant associations.

4. DESCRIPTION OF MAPPED LANDSCAPES

4.1 Falher Plain

The Falher Plain (FP), which occurs below approximately 650 masl, is comprised mainly of clay-rich glaciolacustrine materials (Fig. 3). The level to very gently undulating surface expression may be attributed to the nature of the underlying morainal plain. "Humpy doughnut" topography is commonly associated with this physiographic district. Organic wetlands are common throughout the Falher Plain, especially in the vicinity of Kimiwan and Winagami Lakes.

Vegetation is typical of the Boreal Mixedwood Ecoregion. Deciduous and deciduous dominated mixedwood communities occur over a significant portion of the Falher Plain mainly on Luvisolic and Gleysolic soils that have developed on glaciolacustrine materials. Small remnant white spruce stands occur southeast of Kimiwan Lake also on glaciolacustrine materials. Large, black spruce dominated fens occur east of Kimiwan Lake and are associated with wet, poorly drained soils of the Organic order.

Much of the area west of Winagami Lake and south of Kimiwan Lake has been cleared for agricultural purposes, while portions of the mixedwood stands north of Winagami Lake have been selectively cut for spruce.

4.1.1 Ecosection Descriptions

Ecosection FP.GL1

Landform. This very gently undulating (0-5% slope) landscape is found in the vicinity of Winagami Lake and consists of pronounced humpy doughnut topography with small interspersed organic wetlands. Surficial materials consist of non-compact glaciolacustrine veneers and blankets overlying non to slightly stony till deposits. Textures range from silty loams in the upper 10 to 20 cm to silty clays in the parent materials. Soils are slightly acidic to moderately alkaline and carbonates are generally found within 60 cm of the surface. Soils are generally dark yellowish brown in color. Remnant beach ridges occur adjacent to Winagami Lake.

Ecological Conditions. Moderately well to well drained Orthic and Solonetzic Gray Luvisols support a mixture of either aspen/low-bush cranberry-rose (wild sarsaparilla phase) and white spruce-aspen/low-bush cranberry-rose communities, the latter occurring primarily on the north side of Winagami Lake. Ah or Ahe horizons of 5-10 cm are typical of these soils. Sedge, cattail and rush-dominated wetlands occur in depressional areas interspersed among the uplands.

Many of the white spruce-aspen stands on the north side of Winagami Lake have been disturbed by selective cutting, and as a result, two-aged stands are commonly found. Portions of the ecosection south and east of Winagami Lake have been cleared for crops or fenced for grazing.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Arable	M(H)-H	M	L	L	M	M-H	L	M	L	L

Ecosection FP.GL2

Landform. This subdued landscape (0-2.5% slope) consisting of very compact glaciolacustrine veneers and blankets overlying gently undulating ground moraine, occurs along the western edge of the Falher Plain and includes the town of McLennan. Materials are similar in color, but somewhat more acidic (pH 4.5-5.5) and heavier in texture (silty clays to heavy clays) than those of FP.GL1. Carbonates are generally found within 60 cm of the mineral surface.

Ecological Conditions. Variable aged stands of Aspen/Low-bush cranberry-Rose (wild sarsaparilla and buffalo-berry phases) and White spruce-Aspen/Low-bush cranberry-Rose communities occur in equal proportions across this landscape. These forests have developed on well drained Orthic and Solonetzic Gray Luvisols and poorly drained Orthic Luvic Gleysols. These stands do not appear to be as floristically rich as those of FP.GL1 and are often rather sparsely stocked. Ah or Ahe horizons of 5-10 cm are typical of these soils. Subdued topography combined with the fine textured parent materials result in poorly drained conditions.

Approximately 60% of this landscape has been cleared for agricultural and urban development. Portions of the White spruce-Aspen stands have been disturbed by selective cutting of spruce which appears to contribute to the development of two-aged stands.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Arable	M(H)-H	L	NC	NC	L	H	L	M	L	NC

Ecosection FP.GL3

Landform. This pitted and gently inclined plain occurs north and south of Winagami Lake Provincial Park and is characterized by coarse-textured glaciolacustrine sediments. Textures are mainly sandy loams while soil reactions range from slightly acid to moderately alkaline. Carbonate accumulations are generally found within 50 cm of the surface. Soils are loose to very friable and are yellowish brown in colour. Surface expression is very gently to gently undulating and hummocky (2-9% slope).

Ecological Conditions. Well drained Orthic and Brunisolic Gray Luvisols and Orthic Eutric Brunisols support a combination of young Aspen-Balsam poplar/Low-bush cranberry-Rose and Aspen/Low-bush cranberry-Rose communities. Sedge dominated communities occur to a very minor extent and are found in depressions within pitted terrain. Portions of this landscape south of the Provincial Park have been cleared for agriculture.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Marginal	H	M	L	M	M	M-H	L	M	L	M

Ecosection FP.GL01

Landform. This level to very gently undulating (0-5% slope) landscape is found north of Winagami Lake and consists of a complex of fine-textured glaciolacustrine humpy doughnuts and organic accumulations of sedge and sphagnum peats, the former accounting for nearly 60% of the landscape. Glaciolacustrine materials generally have a silty clay texture and are non-compact and slightly acidic with carbonate accumulations within 60 cm of the surface. Mineral soils are generally a dark yellowish brown in color.

Ecological Conditions. Young even-aged stands of Aspen-Balsam poplar/Low-bush cranberry-Rose and Aspen/Low-bush cranberry-Rose are found on moderately well to poorly drained humpy doughnuts. These stands have developed on Orthic Gray Luvisols and Orthic Luvic Gleysols.

Very poorly drained Fibrisols occur in depressional areas and support a mixture of either Black spruce/Labrador tea/Sphagnum or Willow/Sedge-Reedgrass communities, the latter occurring primarily around the perimeters of these wetlands. Open water is a common component of many of the wetlands.

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Marginal	M	M	H	H	M	M	L	L	L	L

Ecosection FP.01

Landform. This ecosection is comprised of sloping and horizontal fens which are comprised mainly of sphagnum peats, and to a lesser extent, sedge peats. The size of these organic wetlands varies from less than 65 ha to over 1 500 ha. Small, more or less circular mounds of glaciolacustrine materials are scattered throughout many of these wetlands and may account for upwards of 15% of the total land area.

Ecological Conditions. Open Black spruce/Labrador tea/Sphagnum communities dominate on these organic wetlands and have developed on very poorly drained Typic and Terric Fibrisols. Willow/Sedge-reed grass and Tamarack/sedge communities generally occur around the perimeter of large sloping fens. Normally stocked Aspen/Low-bush cranberry-Rose communities are found on glaciolacustrine mounds and have developed on imperfectly drained Gleyed Gray Luvisols.

Portions of these wetlands have been previously burned as evidenced by the large amounts of charcoal within the soil profiles. Reduced productivity can be expected due to waterlogged soils and cold air ponding in these areas.

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Non-Arable	L	L	M	M	M	L	L	L	M	L

Ecosection FP.OGL1

Landform

This level to nearly level (0.0-0.5% slope) landscape is composed mainly of marsh, fen and open water with interspersed islands of fine-textured glaciolacustrine materials. This ecosection borders permanent water bodies and the proportions of wetland and upland terrain vary with the time of the year.

Ecological Conditions. Willow/sedge-reed grass and sedge dominated wetlands with cattails and rushes are the dominant plant communities that occur within this ecosection. Black spruce communities also occur, but to a much lesser extent. These plant communities have developed on very poorly drained Typic and Terric Fibrisols and to a lesser extent an open water and poorly drained peaty Gleysols.

Imperfectly drained Gleyed Gray Luvisols have developed within glaciolacustrine materials and support mature Aspen-Balsam poplar/Low-bush cranberry-Rose communities.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Non-Arable	NC	M(H)	H	H	M	M-L	L	L	L	H

4.1.2 Land Capability Ratings

Land capability ratings for till cropping, forest productivity, wildlife and potential snag habitat are summarized in Table 2.

Table 2

LANDSCAPE RATINGS - FALHER PLAIN

Ecosection / Evaluation	FP.GL1[3]	FP.GL2[4]	FP.GL3	FP.GL01	FP.01	FP.OGL1
Till Cropping[1]	1	1	2	$1^{6}3^{4}$	3	3
Forest Productivity[2]	M(H)-H	M(H)-H	H	$H^{6}L^{2}NC^{2}$	$H^{2}L^{7}NC^{1}$	$H^{1}L^{1}NC$
Wildlife						
Moose	M	L	M	M	L	M(H)
Beaver	L	NC	L	H	M	H
Muskrat	L	NC	M	H	M	H
Lynx	$M^{8}L^{2}$	$M^{4}L^{6}$	M	M	M	M
Coyote	M-H	M-H	M-H	M	L	M-L
Marten	L	L	L	L	L	L
Fisher	L	L	L	L	L	L
Squirrel	L	L	L	L	L	L
Ruffed Grouse	M	M	M	L	L	L
Spruce Grouse	L	L	L	$M^{2}L^{8}$	$M^{7}L^{3}$	$M^{1}L^{9}$
Potential Snag Habitat	L	$H^{4}NC^{6}$	$M^{6}L^{4}$	$M^{3}L^{7}$	L	H

1 Storie Ratings

1 - Fair to fairly good arable
2 - Marginal arable
3 - Non-arable

2 Forest productivity ratings based on provincial site index curves (refer to Tables 5.1-5.5 in Volume II.

3 Mixedwood peninsula on north shore of Winagami Lake is rated slightly higher than rest of FP.GL1 for moose, marten, fisher, squirrel, spruce grouse and snag habitat.

4 Deciduous and mixedwood communities north of Kimiwan Lake are rated as moderate for moose, marten, fisher, squirrel and spruce grouse.

5 Higher ratings apply to agricultural fringe areas.

Evaluation methods are detailed in Appendices 1, 2 and 3, respectively.

4.1.2.1 Till Cropping. Ecosections FP.GL1 and FP.GL2 and the upland portion of FP.GL01 have been rated as having fair to fairly good arable soils. The main limitations are low soil fertility and, to a much lesser extent, unfavorable soil structure (FP.GL2) which may restrict internal drainage. Coarse textured soils in ecosection FP.GL3 result in marginal potential for tilled cropping. Ecosections FP.01 and FP.0GL1 are rated as non-arable because the poorly-drained, wet organic materials are deep (> 1 m) and aereally extensive.

4.1.2.2 Forestry. All upland aspen- and aspen-balsam poplar-dominated communities within the Falher Plain are judged to have high forest productivity potential based on site index values. White spruce-aspen communities are rated as moderately high forest productivity potential. Wetland communities have all been rated as having either low forest productivity potential (black spruce and tamarack) or as non-capable (willow and sedge dominated communities).

4.1.2.3 Wildlife.

Moose

Most of the Falher Plain has been rated as providing moderate quality habitat for moose (FP.GL1, FP.GL3 and FP.GL01). These areas provide low to moderate amounts of food, moderate to high amounts of cover and are characterized by favorable interspersion and

juxtaposition. The mixedwood peninsula area north of Winagami Lake (FP.GL1) and ecosection FP.OGL1 are rated slightly higher. A significant portion of ecosection FP.GL2 has been rated as providing low habitat quality for moose because of the high proportion of cleared land to forest and concomitantly low browse availability. Similarily, ecosection FP.01 is rated as low because of black spruce dominated vegetation is expected to be unproductive of browse.

Upland Game Birds

Ecosections FP.GL1, FP.GL2 and FP.GL3 are judged to provide moderate quality habitat for ruffed grouse as aspen communities are generally in excess of 25 years old and have stem densities between 800 and 4 400 stems/ha. All other ecosections were rated as low because of the absence of aspen communities with these characteristics and because black spruce dominated communities, which provide low quality habitat, are prevalent within wetlands.

Both the mixedwood peninsula area north of Winagami Lake (FP.GL1) and ecosection FP.01, where continuous conifer cover occurs in places, provide moderate quality habitat for ruffed grouse. All other ecosections within the Falher Plain are judged to be low quality habitat for spruce grouse because extensive conifer cover is generally lacking.

Aquatic Furbearers

Ecosections FP.GL01 and FP.OGL1 are rated as high quality habitat for beaver and muskrat. Both of these landscapes have

permanent water bodies that account for over 50% of the total area and typically have young aspen communities on adjacent uplands and well developed emergent vegetation along the shorelines. Ecosections FP.GL3 and FP.01 are rated as moderate quality habitat for muskrat, although both land units have small but permanent water bodies with emergent vegetation, these might largely disappear during dry periods, and hence are not judged to be high quality habitat. All other landscapes within the Falher Plain are rated as low quality habitat primarily because permanent water bodies are infrequent or absent.

Terrestrial Furbearers

With the exception of the mixedwood peninsula area north of Winagami Lake (FP.GL1), the Falher Plain is judged to provide low quality habitat for marten, fisher and squirrel. The mixedwood area north of Winagami Lake has been rated as moderate because of the occurrence of mixedwood communities, disturbed stands and the presence of slash piles and deadfall.

All landscapes with the exception of those ecosections which are mainly cleared land (FP.GL1, FP.GL2) provide moderate quality habitat for hares, and as hares are the main prey for lynx, are assumed to be moderate for lynx.

Well-defined edge habitat created by land clearing for agriculture and the resulting mosaic of cleared and forested land, is abundant in ecosections FP.GL1, FP.GL2 and FP.GL3, and these ecosections are therefore judged to be moderate to high quality habitat

for coyote. All other ecosections are rated moderate to low because of the absence of favorable edge habitat and the presence of forest communities that are judged to have minimal habitat value for prey species important to coyotes.

Snag Habitat

Areas judged to have a reasonably good potential for snag habitat occur in the mixedwood peninsula area north of Winagami Lake (FP.GL1), the open deciduous communities north of Kimiwan Lake (BP.GL2) and the margins of newly flooded land (FP.OGL1). The remainder of the Falher Plain is judged to have low snag habitat potential.

4.2 Bearhead Plain

The Bearhead Plain (BP) lies east of the Falher Plain and north of the Heart River Upland above 650 masl (Fig. 3). It is composed of very gently to gently undulating clay-rich till and glaciolacustrine materials which can generally be distinguished on the basis of colour. Organic wetland terrain is less extensive than in the Falher Plain and is generally found in association with former meltwater channels and active day fluvial systems.

Vegetation of the Bearhead Plain is typical of the Boreal Mixedwood Ecoregion. Deciduous and mixedwood communities occur extensively throughout the Bearhead Plain mainly on relatively well drained Luvisolic soils. Coniferous dominated mixedwood and pure coniferous communities are found north of Bearhead Creek and are

associated with Luvisolic oir Gleysolic soils. Black spruce dominated wetlands are confined to former meltwater channels where drainage is impeded and to the area around Frank Lake. Fibrisols and peaty Gleysols are typical of these areas.

Agricultural and forestry activities are minor, and road access is limited within that portion of the Bearhead Plain occurring within the study area.

4.2.1 Ecosection Descriptions

Ecosection BP.GLM1

Landform. This very gently inclined and undulating (0.5-5.0% slope) till plain occurs north of Winagami Lake and east of Kimiwan Lake. It is characterized by 10 to 20 cm of silt loams overlying silty clay and clay textured till. These till materials are slightly stony, very dark greyish brown in color, and moderate to strongly acid in reaction. At lower elevations (below 655 masl), clay-rich glaciolacustrine materials commonly overlie these till deposits. These are generally yellowish brown in color and moderately acid to neutral in reaction. Ah or Ahe horizons are generally present but do not exceed 10 cm in depth. Carbonates are generally present at depths of one metre or more.

Ecological Conditions. Moist, moderately well to well drained Orthic and Solonetzic Gray Luvisols and imperfectly drained Gleyed Gray Luvisols occur across the landscape and support a mosaic of uneven aged white spruce-aspen/low-bush cranberry-rose communities and young, even-

aged aspen communities consisting of aspen/low bush cranberry-rose. Ah or Ahe horizons of 5-10 cm are typical of these soils.

The White spruce-Aspen communities strongly reflect the influence of selective cutting. Portions of these forests north of Kimiwan Lake have recently been clearcut.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Arable	M(H)-H	M	MC	MC	M	M-H	L	M	L	M

Ecosection BP.GLM1

Landform. This very gently undulating and inclined (2-5% slope) basin east of the South Heart River includes a complex of glaciolacustrine veneers and blankets, and organic accumulations (sphagnum peats) overlying till deposits. Organic wetlands account for approximately 30% of all surficial materials. Textures of mineral parent materials range from silty clay loams to silty clays and soil pH varies from moderately acid to neutral in reaction. Carbonates are generally found below a depth of one metre and soils are characterized by a thin (2-3 cm) Ah or Ahe horizon. The till deposits are similar to those found in other parts of the study area in terms of texture, pH, structure, color and stone content.

Ecological Conditions. Groundwater seepage from the adjacent Heart River Upland (HRU.M1) has resulted in the development of poorly drained Orthic Luvic Gleysols (peaty phases common) and very poorly drained

Fibrisols. Orthic Luvic Gleysols support predominantly mature White spruce/Feathermoss communities, and to a lesser extent, Aspen-Balsam poplar/Low-bush cranberry-Rose communities. Open Black spruce/Labrador tea/Sphagnum communities have developed on organic soils in wet level and depressional areas.

Portions of the white spruce stands have been harvested while portions of the aspen-balsam poplar stands have been cleared for agricultural purposes.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Arable	H	M	L	L	M	M	H-L	L	M-H	M-L

Ecosection BP.M1

Landform. This nearly level to very gently undulating (0.5-5% slope) till plain is adjacent to Bearhead Creek in the northern portion of the study area. Slightly stony, clay-rich tills are overlain by 40-60 cm of sandy material. Very dark grayish tills are slightly acid to neutral in reaction, and carbonates are generally present at depths of greater than one metre.

Ecological Conditions. Moderately well to well drained Orthic and Brunisolic Gray Luvisols support a mixture of open, uneven aged Aspen/Low-bush cranberry-Rose and White spruce-Aspen/Low-bush cranberry-Rose communities, the former is slightly more prevalent. Portions of this ecosection have been cleared for agriculture.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Marginal	M(H)-H	M(H)	NC	NC	M	M-H	M-L	M	M-L	M

Ecosection BP.M2

Landform. This very gently to gently undulating (2-9% slope) and inclined upland area east of Bearhead Creek is predominantly moderately stony till with 15-25% stone content. Some 10-20 cm of loamy material overlies clay loams which range from very dark grey to dark greyish brown in color. These materials are moderately acid in reaction and are very friable to friable. Carbonates are generally at depths below one metre. This landscape is somewhat more dissected by small intermittent streams than is ecosection BP.M1.

Ecological Conditions. Aspen, Aspen-Balsam poplar and White spruce stands occur throughout ecosection BP.M2. They have developed mainly on moderately well drained Orthic Gray Luvisols and imperfectly drained Gleyed Gray Luvisols. Orthic Luvic Gleysols are less extensive. The dominant plant association is Aspen/Low-bush cranberry-Rose and to a lesser extent, White spruce/Feathermoss and Aspen-Balsam poplar/ Alder.

Aspen stands are predominantly open and uneven aged with dense shrubby understories and an overmature deciduous overstory. Young aspen stands are less frequent and are more densely stocked.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Arable	H	M(H)	NC	NC	M	M	M(L)	M	M	M

Ecosection BP.M3

Landform. This nearly level to very gently undulating (2-5% slope) morainal landscape is characterized by pitted surface expression in which small wetlands and open water account for approximately 15-20% of the entire landscape. Till materials are similar to those in ecosection BP.M2. Thin sandy veneers commonly overlie these tills.

Ecological Conditions. Imperfectly drained Gleyed Gray Luvisols and poorly drained Orthic Luvic Gleysols dominate on mineral soils, with young aspen communities and, to a lesser extent, White spruce-Aspen stands. Very poorly drained Fibrisols derived mainly from sedge peats have developed in small depressions and support Willow/Sedge-Reed grass communities with open water in the centres. The dominant upland plant associations include Aspen/Low-bush cranberry-Rose and to a much lesser extent White spruce-Aspen/Low-bush cranberry-Rose.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Arable	M(H)-H	M(H)	L	M	M	M	L	M	L	M

Ecosection BP.01

Landform. Sloping, horizontal and ribbed fens composed mainly of sphagnum peats typify this ecosection. Sedge peats also occur, but to a lesser extent. Small glaciolacustrine islands occur throughout these wetlands and account for less than 5% of the entire ecosection.

Ecological Conditions. Very poorly drained Typic and Terric Fibrisols occur extensively throughout this landscape and support Black spruce/Labrador tea/Sphagnum communities. Peaty Gleysols are less extensive and support Willow/Sedge-Reed grass communities. Tamarack/sedge communities may occur around the perimeter of these wetlands.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Non-Arable	L	L	M	M	M	L	L	L	M	L

Ecosection BP.02

Landform. This landscape includes sloping and horizontal fens occupying glacial meltwater channels. Organic materials consist mainly of sedge and sphagnum peats.

Ecological Conditions. Meltwater channels that have permanent or seasonal streams appear to support Willow/Sedge-Reed grass communities, while meltwater channels with no apparent drainage support Black spruce/Labrador tea/Moss communities. These communities have developed on very poorly drained Fibrisols and poorly drained peaty Gleysols.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Non-Arable	NC	M(L)	M	M	H	L	L	L	L	L

Ecosection BP.OGL1

Landform. This landscape consists of a complex of marsh, fen, open water and small glaciolacustrine islands bordering the flooded portion of the South Heart River. The proportions of each vary seasonally with water level.

Ecological Conditions. The dominant plant communities found within this ecosection include Willow/Sedge-Reedgrass and sedge dominated wetlands with cattails and rushes in the wettest places. The Black spruce/Labrador tea/Moss association also occurs, but to a very limited extent. These wetland communities have developed on very poorly drained Fibrisols and poorly drained peaty Gleysols. Imperfectly to poorly drained Orthic Luvic Gleysols have developed within the glaciolacustrine materials and generally support mature Aspen-Balsam poplar/Low-bush cranberry-Rose stands.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
Non-Arable	NC	M(H)	H	H	M	M-L	L	L	L	H

4.2.2 Land Use Ratings

Land use ratings for till cropping, forest productivity, wildlife and potential snag habitat are summarized in Table 3. Evaluation methods are detailed in Appendices 1 (tilled cropping), 2 (forestry) and 3 (wildlife and snag habitat).

4.2.2.1 Tilled Cropping. The soils of ecosections BP.GLM1, BP.M2 and BP.M3 and a significant portion of BP.GL01 are rated as fair to fairly good arable. Low soil fertility is the main limiting factor. Soil quality within ecosection BP.GLM1 is also limited by moderately acid conditions in the upper 25 cm and the soils of BP.M3 are limited by slightly poorer drainage. The soils of ecosection BP.M1 are rated marginal due to deep sandy veneers which may promote drought conditions. All other landscapes are rated as non-arable, mainly due to excessive moisture conditions and the prevalence of deep organic materials.

4.2.2.2 Forestry. All upland areas within the Bearhead Plain have moderate (high) to high potential for forest productivity based on provincial site index classes. High forest productivity is associated with all aspen and Aspen-Balsam poplar communities, while White spruce-Aspen communities are rated moderately high.

Wetland areas (BP.01, BP.02 and BP.0GL1) are judged to have low potential or are non-capable for forest productivity due to a number of limiting factors, including excessive moisture conditions, deep organic accumulations and open water.

Table 3

LANDSCAPE RATINGS - BEARHEAD PLAIN

Ecosection / Evaluation	BP.GLM1	BP.GL01	BP.M1	BP.M2	BP.M3	BP.01	BP.02	BP.0GL1
Tilled Cropping[a]	1	$1^{7}3^{3}$	2	1	1	3	3	3
Forest Productivity[b]	$H^{8}M(H)^{2}$	$H^{7}L^{3}$	$H^{6}M(H)^{4}$	H	$H^{6}M(H)^{2}NC^{2}$	$L^{4}NC^{1}$	$L^{2}NC^{8}$	$H^{1}L^{1}NC^{8}$
Wildlife								
Moose	M	M	M(H)	M(H)	M(H)	L	M(L)	M(H)
Beaver	NC	L	NC	NC	L	M	M	H
Muskrat	NC	L	NC	NC	M	M	M	H
Lynx	M	$M^{5}L^{5}$	M	$M^{7}L^{3}$	M	M	H	M
Coyote[c]	M-H	M	M-H	M	M	L	L	M-L
Marten	$M^{2}L^{8}$	$H^{5}L^{5}$	$M^{4}L^{6}$	M(L)	$M^{2}L^{8}$	L	L	L
Fisher	$M^{2}L^{8}$	$H^{5}L^{5}$	$M^{4}L^{6}$	M(L)	$M^{2}L^{8}$	L	L	L
Squirrel	$M^{2}L^{8}$	$H^{5}L^{5}$	$M^{4}L^{6}$	M(L)	$M^{2}L^{8}$	L	L	L
Ruffed Grouse	M	$M^{4}L^{6}$	M	M	$M^{8}L^{2}$	L	L	L
Spruce Grouse	$M^{2}L^{8}$	$H^{5}M^{3}L^{2}$	$M^{4}L^{6}$	$M^{3}L^{7}$	$M^{2}L^{8}$	$M^{8}L^{2}$	$M^{2}L^{8}$	$M^{1}L^{9}$
Potential Snag Habitat	H	$M^{5}L^{5}$	$M^{8}NC^{2}$	M	M	L	L	H

[a] Storie Ratings

1 - Fair to fairly good arable
2 - Marginal arable
- Non-arable

[b] Forest productivity ratings based on provincial site index curves (refer to Tables 5.1-5.5 in Volume II).

[c] Higher ratings apply to agricultural fringe areas.

4.2.2.3 Wildlife

Moose

Ecosections BP.M1, BP.M2, BP.M3 and BP.OGL1 are judged to provide moderately high quality habitat for moose on a year round basis. Although these landscapes provide only basic food requirements (relatively low browse productivity), they provide high quality cover and have favorable interspersion and juxtaposition. Ecosections BP.GLM1, BP.GLO1 and BP.O2 have lower ratings because plant communities with low to very low amounts of palatable browse are dominant, although both BP.GLM1 and BP.GLO1 are ranked moderate because ungulate use is apparently high (heavy browse on shrubs at sample sites). Conifer dominated wetland areas (BP.O1) are judged to provide low quality habitat for moose because these areas provide very little food or cover on a year-round basis.

Upland Game Birds

Upland areas within the Bearhead Plain vegetated by either deciduous or mixedwood communities are judged to provide moderate quality habitat for ruffed grouse. All wetland areas, which include BP.O1, BP.O2, BP.OGL1 and a significant portion of BP.GLO1 provide low quality habitat for ruffed grouse.

Significant portions of ecosections BP.GLO1 and BP.M2 are rated as high quality habitat for spruce grouse because continuous white spruce stands greater than 0.5 ha in area, which are important habitat

Ecosections BP.GLM1, BP.M1, BP.M3, BP.O2 and BP.OGL1 are rated as low quality habitat for spruce grouse because extensive conifer stands are lacking or because herbaceous or shrubby wetland vegetation is prevalent.

Aquatic Furbearers

Ecosection BP.OGL1 is rated as high quality beaver and muskrat habitat because of the presence of permanent water bodies that account for greater than 50% of the total area, and because dense emergent vegetation occurrs along portions of the shoreline. Ecosections BP.GLM1, BP.GLO1, BP.M1 and BP.M2 are rated as low quality habitat or as non-capable for beaver or muskrat. These areas are dominated by closed deciduous communities. The wetlands that do occur are probably ephermeral and may be very shallow or non-existent during dry periods. Other landscape units (BP.O1, BP.O2 and BP.M3) are rated slightly higher for muskrat because many of the wetlands contain small and shallow, but permanent water bodies.

Terrestrial Furbearers

A significant portion of ecosections BP.GLO1 and BP.M2 are rated as high quality habitat for marten, fisher and squirrel. These ecosections include continuous white spruce communities with areas greater than 2.6 km^2 and with partially fallen snags. All other landscape units with the exception of wetlands are judged to be moderate quality habitat for marten, fisher and squirrel. Wetlands are rated as low quality habitat for these species.

The Bearhead Plain is rated as moderate quality habitat for hares, and as hares are the main diet of lynx, the area is assumed to be moderate for lynx as well. Ecosection BP.02 is rated as high quality lynx habitat because of the occurrence of dense willow thickets.

With the exception of wetland areas, the Bearhead Plain is rated as moderate quality habitat for coyote. Areas with clearings created by agricultural or forestry activities (BP.GLM1 and BP.M1) are rated as slightly higher quality habitat because of increased edge.

Snag Habitat

Ecosections BP.GLM1 and BP.OGL1 are judged to have high snag habitat potential. These ecosections are characterized by mature to overmature mixedwood communities (BP.GLM1) and recently flooded land (BP.OGL1). Wetlands (BP.01 and BP.02) and recently cleared agricultural land either have a low potential or are non-capable. All other landscapes are judged to have moderate snag habitat potential.

4.3 Heart River Upland

The Heart River Upland (HRU) occurs to the south and east of the South Heart River and occurs between 620 and 685 masl with the highest elevations occurring in the southeastern corner of the study area (Fig. 3). This physiographic district includes mainly clay-rich undulating to inclined till deposits. Below 655 masl glaciolacustrine veneers commonly overlie these till deposits.

Vegetation of the Heart River Upland is typical of the Boreal Mixedwood Ecoregion. Variable-aged mixedwood and deciduous forest communities prevail with understories of low-bush cranberry, rose and red-osier dogwood, and have developed mainly on moderately well to well drained Orthic Gray Luvisols.

4.3.1 Ecosection Descriptions

Ecosection HRU.M1

Landform. This very gently to gently undulating and inclined (2-9% slope) morainal upland occurs east of the South Heart River. The tills typically have approximately 15 cm of loamy material overlying compact clay loams and clay, and are moderately acid and very dark grey to very dark greyish brown in color. Stone content is generally less than five percent. At the highest elevations, till deposits may be underlain by residual materials. Carbonates are generally present at depths of greater than one metre.

Ecological Conditions. Moderately well drained Orthic Gray Luvisols and imperfectly drained Gleyed Gray Luvisols occur across a significant portion of the landscape and generally support stands belonging to the Aspen/Low-bush cranberry-Rose and White spruce-Aspen/Low-bush cranberry-Rose associations. Where drainage is poor, Aspen-Balsam poplar/Low-bush cranberry-Rose stands have developed on Orthic Luvic Gleysols. Ah or Ahe horizons ranging from 2 to 8 cm in depth are typically found within these soils. Portions of these lands have been cleared and cultivated for agricultural pursuits.

4.3.2 Land Use Ratings

Land use ratings for tilled cropping, forest productivity, wildlife and potential snag habitat are summarized in Table 4. Evaluation methods are detailed in Appendices 1, 2 and 3 for tilled cropping, forest productivity, and wildlife and snag habitat, respectively.

4.3.2.1 Till Cropping. The soils of ecosection HRU.M1 are rated as fair to fairly good arable for tilled cropping. The main limitations are soil fertility and, to a much lesser extent, long slopes and unfavorable soil structures.

4.3.2.2 Forestry. Forest productivity within the Heart River Upland is rated as moderately high to high based on provincial site index classes. Approximately 60% of the area is vegetated by deciduous forests which are classed as highly productive, while the remaining 40% is covered with mixedwood communities which are rated as having moderately high productivity.

4.3.2.3 Wildlife

Moose. The northern portion of ecosection HRU.M1 is rated as moderately high quality habitat for moose on a year-round basis; plant communities with low to moderate browse productivity and high cover quality, which are interspersed with contrasting communities within HRU.M1 and adjacent ecosections, are typical of the northern portion. The southern portion of the ecosection has been both selectively logged and partially cleared for agricultural purposes, and is hence judged to

Table 4

LANDSCAPE RATINGS - HEART RIVER UPLAND

Ecosection / Evaluation	Heart River Upland HRU.M1
Tilled Cropping[a]	1
Forest Productivity[b]	$M(H)^{3}H^{7}$
Wildlife	
Moose[c]	M(H)-L
Beaver	NC
Muskrat	NC
Lynx	M
Coyote[c]	M-H
Marten	$M^{5}L^{5}$
Fisher	$M^{5}L^{5}$
Squirrel	$M^{5}L^{5}$
Ruffed Grouse	$M^{5}L^{5}$
Spruce Grouse	$H^{2}M^{2}L^{6}$
Potential Snag Habitat	$H^{5}M^{4}NC^{1}$

a Storie Ratings
1 - Fair to fairly good arable
2 - Marginal arable
3 - Non-arable

b Forest productivity ratings based on provincial site index curves (refer to Tables 5.1-5.5 in Volume II).

c In southern portion of HRU.M1 where a large portion of the forest has been either cleared or thinned, habitat is rated as low for moose and high for coyote.

be low quality habitat.

Upland Game Birds

Ruffed grouse habitat is rated as moderate to low quality in ecosection HRU.M1. While approximately 60-70% of the area is occupied by deciduous communities, some of these stands are very open. Approximately only 50% of the area has been rated as providing moderate quality habitat for ruffed grouse.

Approximately 20% of ecosection HRU.M1 is judged to be high quality habitat for spruce grouse because of the occurrence of pure white spruce communities with average greater than 2.6 km^2. Another 20% of the area is rated moderate because coniferous dominated mixedwood communities occur and provide basic habitat requirements. The remainder is rated as low quality habitat for spruce grouse.

Aquatic Furbearers

Ecosection HRU.M1 is rated as non-capable for both beaver and muskrat because it lacks either permanent water bodies or small wetlands with emergent vegetation.

Terrestrial Furbearers

Ecosection HRU.M1 is judged to provide moderate quality habitat for terrestrial furbearers. That portion of HRU.M1 which has been partially cleared and selectively cut is rated as low quality habitat for marten, fisher and squirrel and as high for coyote, the latter because edge is created by clearing activities.

Snag Habitat

Forested lands occurring within ecosection HRU.M1 are rated as having moderate to high potential for snag habitat. Many of these stands are mature and overmature deciduous and coniferous forests. Portions of the area have been selectively cut resulting in windfalls and slash piles, which may provide hiding cover for some wildlife species.

5. FLUVIAL AND AQUATIC ECOSECTIONS

5.1 Description of Fluvial and Aquatic Ecosections

Fluvial Ecosection F1

This aquatic ecosection includes that portion of the South Heart River below the Heart River Dam. Strongly sloping (15-30% slope) valley walls with level to very gently sloping (0-5% slope) undulating terraces are typical. Stream gradient is between 0.5-1.0% and stream substrate is mainly gravel and sand. Terraces are characterized by well to rapidly drained Regosols which have developed primarily within sandy parent materials.

Valley walls are vegetated by a complex of Aspen-Balsam poplar, White spruce/Feathermoss and Aspen/Low-bush cranberry-Rose stands. On lower terraces, where mineral-rich groundwater is near the soil surface, Balsam poplar/Red-osier dogwood communities have developed.

Sand and gravel extraction operations are currently ongoing along this river course.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
NC	H	H	M	M	H	M-H	L	M	L	H

Fluvial Ecosection F2

This ecosection includes a nearly level (0-0.5% slope), very gently meandering portion of Bearhead Creek. The stream has cut a narrow, steep-walled channel with numerous small terraces and relic oxbows. Substrate materials generally consist of silts and sands.

Dense willow communities with understories of reed grass and sedge constitute the dominant vegetation along this stream. This type of plant community has developed on very moist to wet Regosols or Gleysols.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
NC	NC	M(H)	H	L	H	L	L	L	L	L

Fluvial Ecosection F3

This ecosection includes the very slowly flowing unnamed tributaries of the South Heart River and Bearhead Creek and streams flowing into Kimiwan Lake. Stream gradient is less than 0.1% and portions of these tributary streams have infilled with organic accumulations. Substrate materials generally consist of fine sand, silts and clays.

Willow/Sedge dominated communities occur along the fringes of these streams. These communities have developed on peaty Gleysols and Fibrisols. Cattail, rushes and sedge are common components of these

stream channels, especially where beaverdams have created standing, open water.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
NC	NC	M	H	L	H	M	L	L	L	L

Aquatic Ecosection W1

This ecosection includes the very shallow water bodies of both Kimiwan and Frank Lakes. Water depth varies from 45 cm in Kimiwan Lake to nearly 200 cm in Frank Lake. Neither lake has a natural outflow, and both are surrounded by extensive organic wetlands.

Changing lake levels, cattle grazing and tilled/forage cropping have extensively modified lakeshore vegetation around Kimiwan Lake. Kimiwan Lake is surrounded by a narrow (20-30 m) discontinuous band of bulrush (**Scirpus validus**) and cattail (**Typha latifolia**). Duckweed and algal growth occurs in extremely shallow water around much of Kimiwan Lake. Emergent vegetation is somewhat more continuous around Frank Lake.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
NC	NC	L	L	L	NC	NC	NC	NC	NC	NC

Aquatic Ecosection W2

This ecosection includes Winagami Lake and the dammed portion of the South Heart River. Both of these water bodies are deeper than either Frank or Kimiwan lakes and neither have been disturbed to the same extent as Kimiwan Lake.

A generally well developed sequence of emergent vegetation belts has developed along Winagami Lake and, to a lesser extent, along the South Heart River reservoir. Bulrushes predominate in deeper water with lesser amounts of cattail closer to the shore. Sedges, primarily, water sedge (**Carex aquatalis**), constitute the predominant vegetation cover in very shallow water areas.

LANDSCAPE EVALUATIONS

Tilled Cropping	Forest Productivity	Moose	Beaver	Muskrat	Lynx	Coyote	Marten, Fisher Squirrel	Ruffed Grouse	Spruce Grouse	Snag Habitat
NC	NC	L	L	L	NC	NC	NC	NC	NC	NC

5.2 Land Use Ratings

Land use ratings for till cropping, forest productivity, wildlife and potential snag habitat are summarized in Table 5. Evaluation methods are detailed in Appendices 1, 2 and 3 for tilled cropping, forest productivity, and wildlife and snag habitat, respectively.

Table 5

LANDSCAPE RATINGS - AQUATIC LANDSCAPES

Ecosections / Evaluations	AQUATIC ECOSECTIONS				
	F1	F2	F3	W1	W2
Till Cropping	NC	NC	NC	NC	NC
Forest Productivity	H	NC	NC	NC	NC
Wildlife					
Moose	H	M(H)	M	L	L
Beaver	M	H	H	L	H
Muskrat	M	L	L	L	M
Lynx	H	H	H	NC	NC
Coyote	M-H	M	M	NC	NC
Marten	H M L	L	L	NC	NC
Fisher	H M L	L	L	NC	NC
Squirrel	H M L	L	L	NC	NC
Ruffed Grouse	M L	L	L	NC	NC
Spruce Grouse	H M L	L	L	NC	NC
Potential Snag Habitat	H	L	L	NC	NC

[a] Storie Ratings

1 - Fair to fairly good arable
2 - Marginal arable
3 - Non-arable
NC - Non-capable

[b] Forest productivity ratings based on provincial site index curves (refer to Tables 5.1-5.5 in Volume II).

[c] Higher ratings apply to agricultural fringe areas.

5.2.1 Till Cropping

All water courses and water bodies are rated as non-capable.

5.2.2 Forestry

With the exception of ecosection F1, all other fluvial and aquatic ecosections are rated as non-capable for forestry production. Ecosection F1 is the only fluvial ecosection that is not characterized by either dense willow thickets or open water. The deciduous, mixedwood and coniferous communities that occur along the South Heart River (F1) are all judged to be highly productive based on provincial site index classes.

5.2.3 Wildlife

Moose. Kimiwan and Frank lakes (W1), Winagami Lake and the South Heart River reservoir (W2) are rated as low quality habitat for moose. All other fluvial and aquatic ecosections are rated as moderate to high quality habitat for moose. These areas provide movement corridors for moose and are characterized by plant communities which meet food and cover requirements on a year-round basis.

Upland Game Birds. Other than small portions of the South Heart River (F1), all fluvial and aquatic ecosections are rated as low quality habitat (ecosections F1, F2 and F3) or are non-capable (ecosections W1 and W2) for upland game birds. Coniferous stands along the South Heart River are rated as high quality habitat for spruce grouse while deciduous communities are judged to provide moderate quality habitat for ruffed grouse.

Aquatic Furbearers. Kimiwan and Frank lakes (ecosection W1) are too shallow to provide aquatic year-round beaver habitat. The South Heart River (ecosection F1) is rated as moderate because of potential disturbances associated with aggregate mining, which occurs along a significant portion of the stream course within the study area. Other fluvial and aquatic ecosections are rated as high quality habitat for beaver.

All water bodies and water courses are rated somewhat lower for muskrat habitat. Fluvial and aquatic ecosections F2, F3 and W1 are judged to provide low quality habitat because of seasonal water fluctuations and the lack of emergent vegetation and bank habitat. Ecosections F1 and W2 are rated as moderate because of more stable water levels, more abundant emergent vegetation and the presence of bank habitat.

Terrestrial Furbearers. Fluvial and aquatic ecosections F2, F3, W1 and W2 and a major portion of F1 are rated as low to non-capable for marten, fisher and squirrel because of the lack of coniferous stands. Approximately 30% of F1 is rated as moderate to high for these species because of the presence of mixedwood and coniferous communities.

Fluvial ecosections F1, F2 and F3 are judged to provide high quality habitat for lynx on the assumption that these areas would be highly favorable for hare. These areas are vegetated by forests with dense shrubby understories and by dense willow thickets. Large water bodies (W1 and W2) are non-capable for lynx habitat.

Fluvial ecosections F1, F2 and F3 are rated as moderate to high quality habitat for coyote while W1 and W2 are rated as non-capable. The South Heart River provides slightly better coyote habitat than other river or stream courses because of edge habitat created by agricultural clearing near the river.

Snag Habitat. Forest communities along the South Heart River (F1) have high potential for snag habitat. Stands in which snags are most likely to be found include mature and overmature deciduous communities, mixedwood communities, and maturing white spruce stands. Fluvial ecosections F2 and F3 are rated low because the plant communities bordering these water courses are predominantely willow shrublands. Both Kimiwan and Winagami lakes are rated as non-capable for snag habitat; however, snags are likely to occur along the lakeshore (ecosections BP.OGL1, FP.OGL1).

Appendix 1

TILLED CROPPING

Till cropping evaluations were derived for individual ecosections based on a Soil Rating Schedule (1979) developed by the Lands Division, Alberta Energy and Natural Resources, Alberta Soil Survey and Alberta Municipal Affairs (Table 1).

The first step in using the Soil Rating Schedule (1979) system is to identify the soil zone that represents the study area in question. Soil zones roughly approximate climatic zones. For example, Gray Luvisols typically occur under boreal forests and imply a particular climatic regime. Once the soil zone has been recognized, it is then rated according to the number of frost-free days in the area. Secondly, soil profile variation, soil texture, stoniness and topography are rated. These ratings represent percentages and are sequentially multiplied by the soil rating. For example:

Ecosection BP.M1

Soil Zone	Gray Luvisol - less than 5 cm Ah, greater than 15 cm Ae; approximately 80 frost-free days	50
Profile Variation	weak solonetzic structures	90/100
Texture	loams over clay loams	90/100
Stoniness	5-10% gravels	85/100
Topography	2-5% slopes	80/100

50 x 0.90 x 0.90 x 0.85 x 0.80 = 27.5

Calculations are done using individual plot data to obtain an overall rating for each ecosection. Each ecosection is assigned to an evaluation class in accordance with the number of points derived from the above procedure (Table 2).

Table 1

STORIE INDEX RATINGS

Storie Index Classes	Numerical Rating	Capability
5	28 - 41	Fair to fairly good arable
4	16 - 28	Marginal arable
3	9 - 16	Good to excellent pasture
2	4 - 9	Fair to good pasture
1	0 - 4	Poor to fair pasture

Source: Alberta Soils Advisory Committee. 1983. Agriculture Systems of Rating Arable Land in Alberta. Soils Branch, Alberta Agriculture, Edmonton.

Table 2

SOIL RATING SCHEDULE 1979

Soil Zone (Colour and Depth of Ah Horizon)	Rating
1. Brown	30-45
2. Dark Brown	45-70
3. Thin Black - less than 15 cm Ah	70-85
4. Black - more than 15 cm Ah	85-100
5. Dark Gray - generally 10-15 cm Ah	
(a) +90 frost-free days	75-85
(b) 75-90 frost-free days	65-75
(c) 60-75 frost-free days	55-65
6. Dark Gray Luvisol - greater than 5 cm Ah, less than 10 cm Ah, Ae exceeding Ah	
(a) +90 frost-free days	65-75
(b) 75-90 frost-free days	55-65
(c) 60-75 frost-free days	45-55
7. Gray Luvisol - less than 5 cm Ah, Ae exceeding Ah but less than 15 cm	
(a) +90 frost-free days	65-70
(b) 75-90 frost-free days	55-65
(c) 60-75 frost-free days	45-55
8. Gray Luvisol - less than 5 cm Ah, greater than 15 cm Ae	
(a) +90 frost-free days	50-55
(b) 75-90 frost-free days	40-50
(c) 60-75 frost-free days	35-45
9. Brunisolic Gray Luvisol and Podzol	
(a) +90 frost-free days	35-45
(b) 75-90 frost-free days	30-35
(c) 60-75 frost-free days	25-30

Profile Variation	
1. Immature (little or no profile development)	50-90
2. Normal profile - moderately to well developed, well drained	90-100
3. Shallow profile - on slopes, on gravel, on bedrock, etc.	10-90
4. Deep mineral surface layer - some low areas, wind accumulation, etc.	80-120
5. Solonchak - saline - little profile development	20-50
6. Solonetz - some saline - well developed hardpan, near surface	30-60
7. Solodized Solonetz - fairly well developed hardpan, some Ae	50-80
8. Solodic - weak hardpan, often appreciable Ae	70-90
9. High lime profile - lime at or very near surface	50-80
10. Gleysolic - low and high humic, non-saline soils, lacking good drainage	40-80
11. Organic - Humisol	55-80
- Mesisol	35-55
- Fibrisol	10-35
12. Acidity - at approximately 25 cm - pH 5.5-5.0	60-80
- pH 4.5-5.0	30-60
- pH less than 4.5	10-30

Texture	
1. Sand [with normal subsoil - (sand)]	10-25
2. Loamy sand [with normal subsoil - (sandy)]	25-40
3. Sandy loam [with normal subsoil - (heavier)]	40-70
4. Loam [with normal subsoil - (heavier)]	60-90
5. Silt loam [with normal subsoil - (heavier)]	80-100
6. Clay loam [with normal subsoil - (heavier)]	75-95
7. Clay [with normal subsoil - (clay)]	60-90

Stones	
0. None	100
1. Few - no serious handicap to cultivation	95
2. Some - require removal	85
3. Many - serious handicap to cultivation	75
4. Very many - excessively stony for cultivation	50

Topography	% Slope	Variation Frequency per Half Mile	Rating
1. Level and depressional	0	0	50-90
2. Level to gently undulating	0 to 1	2 or less	90-100
3. Undulating	1 to 2	2 or less	80-90
4. Very gently rolling	2 to 4	3 or more	70-80
5. Gently rolling	4 to 8	3 or more	60-70
6. Moderately rolling	8 to 15	3 or more	40-60
7. Strongly rolling and hilly	Over 15	3 or more	30-40

Appendix 2

FORESTRY EVALUATIONS

Forest productivity information is used as the sole criterion upon which forestry evaluations for individual ecosection are based. It is recognized that other ecological and silvicultural factors (e.g., erosion, site treatment, species selection) should also be included in forestry evaluations. However, because of time constraints, development of an appropriate evaluation methodology was directed towards a reproducible means of assessing productivity.

The plant association is used here as the basic productivity unit. Height, age and diameter measurements from all plots included within an association are used to calculate site index (SI), a measure of site productivity commonly employed in forest site assessment. Simple descriptive statistics (mean, standard deviation) are calculated for SI for each association. Subsequently, associations can be compared and ranked according to relative productivity on a local or provincial scale. This methodology is more fully detailed in Section 5 of Volume II.

Once plant associations have been classified, data from individual sites within ecosections along with 1:15 000 Phase 3 forest cover maps and available air photos are used to deduce the most commonly occurring associations within a given ecosection. A simple productivity rating for SI can then be assigned to an ecosection if associations of similar productivity predominate (e.g., moderate or M).

Where two or three associations with different productivities occur within an ecosection, it is necessary to define productivity complexes. Given the low sampling intensity and the scale of air photos available for the Kimiwan-Winagami study, it is impossible to accurately determine the percentage of aerial coverage of a given association within an ecosection. Therefore, broad productivity complexes using intervals of 20-30% are used. For example, in a given ecosection one association ranked as being highly productive (H) might be judged to occur over about 70% of the area, and another association which is moderately productive (M) over the remaining 30%. The productivity complex is thus H^7M^3. A maximum of three associations are used to define productivity complexes.

Appendix 3

HABITAT EVALUATION METHODS FOR SELECTED UNGULATE, FURBEARER AND UPLAND GAME BIRD SPECIES

Habitat evaluation criteria are presented for the following species.

1. Ungulates

   1.1 Moose

2. Terrestrial Furbearers

   2.1 Marten, Fisher and Squirrel
   2.2 Lynx
   2.3 Coyote

3. Upland Game Birds

   3.1 Ruffed grouse
   3.2 Spruce grouse

4. Aquatic Furbearers

   4.1 Beaver
   4.2 Muskrat

5. Snag Habitat

The methods presented have been developed with reference to published habitat models, and through literature searches and communication with regional habitat biologists, with emphasis on techniques applicable to the scale at which integrated resource inventories are conducted (1:100 000).

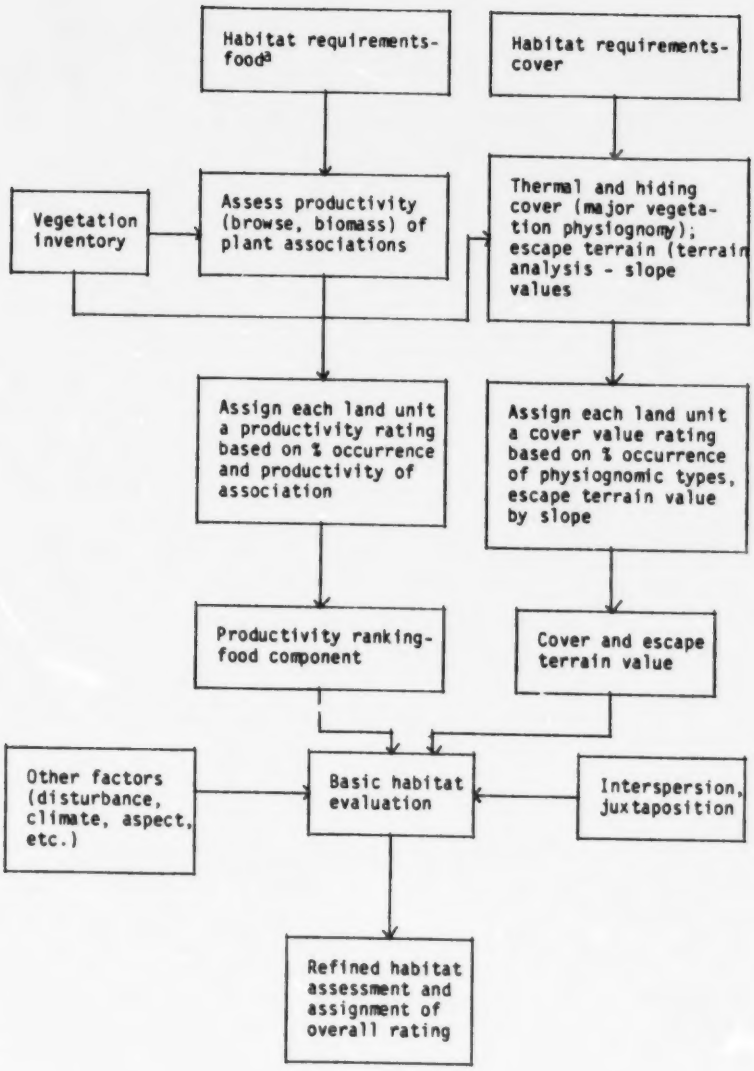
1. UNGULATES

A sequence of steps was followed in evaluating the habitat suitability of individual landscape units for moose. Figure 1 shows a general scheme for ungulate habitat evaluation. Each of these steps is detailed below.

1. Major habitat requirements (food and cover) for ungulates were identified, reviewed and summarized. Weightings were assigned to these requirements as per Fish and Wildlife Species Habitat Relationship Models (IEB Beak, 1984).

2. For a given landscape unit, the major physiognomic types (e.g. deciduous forest), and plant associations (e.g. Balsam poplar/Dogwood) that occur within are identified and recorded with an estimate of percent age occurrence (e.g. 70% Willow shrubland and 30% Aspen/Low-bush cranberry-Rose).

3. Using relative productivity rankings derived from statistical analyses of biomass productivity for each plant association, forage and biomass productivity were rated for individual landscapes based on the plant association present within. For example, where an association judged to have low productivity occurred over 70% of a landscape unit and one judged to have moderate productivity over the remaining 30%, the landscape unit was rated M^3L^7. Because browse and biomass data collection was not requested by the client


Habitat requirements-food[a]
Habitat requirements-cover
Vegetation inventory
Assess productivity (browse, biomass) of plant associations
Thermal and hiding cover (major vegetation physiognomy); escape terrain (terrain analysis - slope values
Assign each land unit a productivity rating based on % occurrence and productivity of association
Assign each land unit a cover value rating based on % occurrence of physiognomic types, escape terrain value by slope
Productivity ranking-food component
Cover and escape terrain value
Other factors (disturbance, climate, aspect, etc.)
Basic habitat evaluation
Interspersion, juxtaposition
Refined habitat assessment and assignment of overall rating

[a] Weight assigned is species dependent

Fig. 1. GENERAL FRAMEWORK - UNGULATE HABITAT EVALUATION

for the Kimiwan-Winagami study area, it was necessary to infer relative browse and biomass productivity for each association, with reference to data trends identified in the Keg River area (Brierley et al. 1985, Volume II).

4. Using the species habitat relationship models, cover was rated for individual landscapes by physiognomic criteria and may vary seasonally with changes in foliage. For example, closed coniferous forests might provide year-round cover for some species and might therefore be rated as high quality, whereas deciduous forests provide moderate cover during the winter and high cover during the summer (Tables 1 and 2).

5. Interspersion and juxtaposition were assessed to modify the rating obtained from food and cover assessments. Both are discussed below.

Interspersion

Interspersion is defined as "a measure of heterogeneity for both food and cover attributes within a landscape," a modification of the definition given by Giles (1978, in Heinen and Cross 1983). A three-level hierarchy was developed with classes defined as follows:

Low - the occurrence of two or more similar (in terms of food and cover) plant associations having low habitat values (food and cover), or the dominance of one plant association having low habitat value.

Moderate - the occurrence of two or more plant associations each of which satisfies some of the habitat requirements.

High - the occurrence of two or more plant associations which, alone or in combination, satisfy all the major habitat requirements.

Juxtaposition

Juxtaposition is defined as "an assessment of the habitat value of a landscape relative to that of adjacent landscapes and the contribution of the adjacent landscapes to the landscape being evaluated for a given wildlife species," a modification of the definition given by Giles (1978, in Heinin and Cross 1983). Juxtaposition was not assessed in the Fish and Wildlife Habitat Relationship Models (IEC Beak 1984) which were developed for use with 1:1 000 000-scale habitat subregion maps. However, at a scale of 1:100 000, as applied to integrated resource inventory and planning processes, a measure of juxtaposition may be just as important or even more important than a measure of interspersion. Because wildlife can be highly mobile, any given landscape unit may form only a part of the individual animal's range. It follows that, for wildlife evaluations, landscapes should not be treated as discrete units, but should be evaluated with reference to adjacent landscapes. Juxtaposition is very similar to interspersion in that is is a measure of habitat heterogeneity; the difference is that juxtaposition equals heterogeneity between landscapes, whereas interspersion equals heterogeneity within landscapes.

A three-level hierarchy similar that for interspersion was used to judge juxtaposition.

Low - plant associations within a given landscape which are either the same or similar in terms of food and cover to those of adjacent landscapes; and/or adjacent landscapes include plant associations which are of low habitat value.

Moderate - the occurrence in adjacent landscapes of plant associations which contrast with those of the landscape being evaluated, and which satisfy some of the major habitat requirements (food or cover).

High - the occurrence in adjacent landscapes of plant associations which contrast with those of the landscape being evaluated, and which satisfy all of the major habitat requirements.

Boundary characteristics such as the degree of interdigitation, number of adjacent landscapes and area and shape of the landscape being evaluated are also considered.

6. Landform, relief, disturbance, aspect and aquatic form are also considered in habitat suitability assessment. In the Fish and Wildlife Species Habitat Relationship Models, these variables are considered less important than vegetation (food and cover) and interspersion. Accordingly, such variables are not considered as important in the evaluations, in most cases, and are used to modify the

ranking obtained from food, cover, interspersion and juxtaposition.

7. A five-level hierarchy was used to rank landscape units for ungulates based on habitat quality.

H	High
M(H)	Moderate (High)
M	Moderate
M(L)	Moderate (Low)
L	Low

These are defined as follows:

High - high to moderate food availability, high to moderate cover quality, high interspersion and high juxtaposition.

Moderate - moderate food availability, moderate to high cover quality, moderate interspersion and moderate juxtaposition. This class has been divided into three subclasses as above. It is here that the other variables such as landform, aspect, etc. come into play in modifying the evaluation.

Low - low to very low food availability, low to high cover quality, low interspersion and juxtaposition.

1.1 Moose

Habitat suitability evaluations for moose were conducted as stated above. Food and cover (Tables 1 and 2) are assumed to contribute 60% and 40% of the habitat requirements for moose, respectively.

Table 1

THERMAL COVER REQUIREMENTS FOR MOOSE
DURING THE FALL/WINTER PERIOD

Ranking	Physiognomic Structure	Rationale/Reference
Best	Coniferous forest Coniferous-dominated mixed forest	Coniferous forest provides the best cover and suitable coniferous stands may be found in coniferous-dominated mixed forests.
Moderate	Deciduous forest Deciduous-dominated mixed forest Muskeg	Mixedwood and deciduous forest can be utilized as cover during fall/winter. Muskeg with a significant percentage of treed cover can provide thermal cover.
Poor	Shrubland Shrubland with subdominant grass/forb	Categories ranked as poor offer little treed cover.
Inadequate	Non-vegetated water Cultivated Cultivated annual crops Cultivated perennial forage	Forest cover is required to provide thermal cover for moose during fall/winter; therefore categories with no forest cover are inadequate.

Table 2

THERMAL, REPRODUCTIVE AND ESCAPE COVER REQUIREMENTS
FOR MOOSE DURING THE SPRING/SUMMER PERIOD

Ranking	Physiognomic Structure	Rationale/Reference
Best	Coniferous forest Coniferous-dominated mixed forest Deciduous-dominated mixed forest Deciduous forest	Wooded categories provide the best cover because of the dense overstory in coniferous forest and the well-developed understory of deciduous forest. These provide maximum shade and obstruction of lines in sight.
Moderate	Shrubland	The categories ranked as moderate and poor have progressively less vegetation that offers shade and obstruction to lines of sight.
Poor	Shrubland with subdominant grass/forb Muskeg	
Inadequate	Non-vegetated water Emergent aquatics Mixed grass/forb cover Cultivated Cultivated annual crops Cultivated perennial crops	Trees or tall shrubs are required to provide the obstruction of lines of sight needed for reproductive and escape cover, and to provide shade to lessen heat stress, for an animal the size of a moose. Therefore, categories without treed or tall shrub cover are inadequate.

2. TERRESTRIAL FURBEARERS

Habitat suitability evaluations were requested for marten, fisher, squirrel, lynx and coyote. It was found that in some instances, habitat assessment was more dependent upon prey species (lynx cycle is closely tied to that of hare), while for other species (marten, fisher and squirrel), habitat was evaluated using cover type, stand density and prey species habitat as criteria.

2.1 Marten, Fisher and Squirrel

Based on literature review and existing models (Alberta ENR 1984c) the following three-level hierarchy was developed to evaluate the suitability of marten habitat.

High - mature to overmature coniferous forests composed of at least 40% white spruce or fir with canopy closure greater than 50% with presence of partially fallen snags; stands must be greater than 2.6 km^2 in area.

Moderate - coniferous forests with less than 50% canopy closure and greater than 2.6 km^2 in area; coniferous or mixedwood stands that have been selectively cut with presence of downfall or slash piles (habitat for prey species).

Low - coniferous or mixed stands less than 2.6 km^2 in area; aspen communities and shrubby and herbaceous wetlands.

2.2 Lynx

Based on discussions with habitat biologists (A. Todd, K. Moller, B. Wynes 1986) and information gathered through literature review (Thomas 1979), the following rating scheme has been developed for evaluating lynx habitat suitability. The scheme recognizes the importance of varied hare as a major component of the lynx diet, and consequently ranks habitat according to how well life requisites of hare are met.

High - willow thickets, river valleys, aspen communities with dense understory vegetation suitable for hare browse, or very young dense coniferous stands which provide hiding cover for hare.

Moderate - coniferous wetlands with a minor component of willow; deciduous and mixedwood communities with lesser amounts of shrub, forb and graminoid vegetation.

Low - mature coniferous communities with little or no shrub, forb or graminoid vegetation; cleared agricultural land.

Non-capable - water bodies.

2.3 Coyote

The following evaluation criteria were developed through literature review (Thomas 1979) and communication with the regional habitat biologist for Peace River (K. Moller 1986). A four-level hierarchy was developed to evaluate landscape suitability for coyote.

High - areas with abundant edge created as a result of agricultural clearing, logging or fire which support a high populuation of prey species.

Moderate - areas in which agricultural clearing, clear cutting or fire have not been a major influence, but prey species are found.

Low - areas with continuous cover which have relatively little food value for prey species, no edge.

Non-capable - open water.

3. UPLAND GAME BIRDS

3.1 Ruffed Grouse

The following evaluation scheme for ruffed grouse was developed through discussions with the regional habitat biologist for Peace River (K. Moller 1986) and with reference to a habitat suitability index model for ruffed grouse developed by the Fish and Wildlife Service, U.S. Department of the Interior (Cade and Sousa, 1985). Stem density estimates for forest stands, which are required for habitat evaluations, were obtained from detailed mensuration data collected during the summer of 1985 for the Smoky-Peace Point area.

A three-level hierarchy was developed to present the suitability of individual landscapes for ruffed grouse habitat.

High - young aspen communities with a stem density greater than 4 400 stems/ha; stands are 6-25 years old, with stems greater than 1.8 m tall and an average canopy height of greater to or equal to 4.6 m.

Moderate - aspen communities greater than 25 years old with average stem densities between 800 and 4 400 stems/ha; these communities may provide essential winter, summer and nesting habitat.

Low - muskeg, low shrublands and coniferous stands with average stem densities less than 800 stems/ha.

Non-capable - open water, cleared agricultural areas without residual stand.

Deciduous dominated mixedwood communities with 15-30% coniferous cover were judged to provide the best thermal cover, and hence the presence of clumpy spruce stands was used to modify rating obtained on the basis of stand density and age. For example, a landscape rated as having low suitability for ruffed grouse was ranked as moderate if small suitability for ruffed grouse was ranked as moderate if small stands of white spruce were scattered throughout the landscape.

3.2 Spruce Grouse

The following evaluation criteria and classes were developed through communication with the regional habitat biologist for Peace River (K. Moller 1986). There appears to be little readily available published information concerning this species.

High - continuous white spruce stands greater than 0.5 ha in area.

Moderate - mixedwood communities where deciduous and coniferous trees occur in equal proportions or deciduous stands with small (0.1-0.5 ha) pure conifer stands; coniferous wetlands.

Low - pure deciduous forests and herbaceous or shrubby wetlands.

Non-capable - open water, cleared agricultural areas without residual stands.

4. AQUATIC FURBEARERS

4.1 Beaver

The following habitat suitability assessment framework to assess the suitability of individual landscapes for beaver was developed using several habitat suitability index models (Allen 1982; Alberta ENR 1984a) and through discussions with the regional habitat biologist for Peace River (K. Moller 1986).

High - permanent water bodies that occupy greater than 50% of the landscape being evaluated, with adjacent upland terrain containing young aspen; water depth greater than one metre; minimum water level fluctuations.

Moderate - permanent water bodies that meet the habitat requirements but occupy 10-50% of the landscape area.

Low - upland areas with small water bodies which are either less than one metre in depth and/or are intermittent. These water bodies also usually account for less than 10% of the total landsape area being evaluated.

Non-capable - upland areas with no water bodies.

4.2 Muskrat

Information to assess the habitat suitability of particular landscapes for muskrat was obtained from habitat suitability index models (Allen and Hoffman 1984). A four-level hierarchy was established to present the evaluations.

High - 50% or more of wetland areas within ecosection densely covered by emergent vegetation; water level fluctuations are minimal.

Moderate - 10-50% of the wetland area densely covered by emergent vegetation.

Low - less than 10% of the wetland area densely covered by emergent vegetation; open lakes or ponds are included in this category, as are low-lying areas occupied by vegetation more characeristic of relativey dry conditions than of standing water environments.

Non-capable - upland areas having no wetland communities that satisfy habitat requirements, or having wetland communities (e.g. black spruce fens) that are of low habitat value.

5. POTENTIAL SNAG HABITAT

Information used in the assessment of forested communities for potential snag habitat was obtained from discussions with regional wildlife biologists and Thomas (1979).

An attempt was made to analyse detailed mensuration data for individual plots and plant associations on the basis of dead stems, height of dead stems, and diameter of dead stems. This, however, did not produce a reasonable correlation between dead stem densities and plant associations given the level of sampling undertaken.

The following evaluation scheme provides a subjective approach to potential snag habitat assessment. It presents a four-level hierarchy based on stand composition, degree of disturbance and age of stand.

High - old seral stands and overmature deciduous stands greater than 80 years; overmature climax white spruce stands; margins of newly flooded lands (beaver dams, man-made dams); selectively cut stands and major stream courses.

Moderate - mature deciduous forests that have not been disturbed; mixed deciduous-coniferous stands.

Low - wetlands, very young aspen stands; pure, young white spruce stands.

Non-capable - agricultural lands; open water.

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Volume

2

Integrated Resource Inventory
Kimiwan - Winagami Volume II

Alberta
FORESTRY, LANDS AND WILDLIFE
Resource Evaluation
and Planning

INTEGRATED RESOURCE INVENTORY

OF

THE KIMIWAN-WINAGAMI STUDY AREA

Volume II

Vegetation Classification

by:

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VOLUME II

VEGETATION CLASSIFICATION OF THE KIMIWAN-WINAGAMI STUDY AREA

1. INTRODUCTION

This volume supports the main Kimiwan-Winagami Integrated Resource Inventory and Evaluation document (Volume I). In Volume I, plant associations are correlated to ecosections (landscape units). In Volume II, these plant associations are described in more detail with reference to both floristic and environmental characteristics.

There are five sections in Volume II. Topics covered include study methods, plant association descriptions, plant succession and productivity. Study area location, land use and natural resource information (including vegetation), and overall study methodology are covered in Volume I. A more detailed discussion of related vegetation work is included where appropriate in Volume II. The appendices to Volume II include vegetation, mensuration, environment and soils data for individual sites examined during this study.

2. STUDY METHODS

2.1 Field Sampling

Before field sampling, background information from previous resource inventory studies was examined along with air photos to produce a preliminary landscape stratification. Study plots were subsequently chosen using the preliminary landscape units as sampling areas. Within these, plant communities were selected that appeared to be extensive and relatively homogeneous.

At each site, vegetation and environment data were collected. Mensuration, palatable browse data were also collected at a number of sites so that site productivity could be determined. Data collection methods are fully detailed in the Integrated Resource Inventory Site Manual (Alberta Energy and Natural Resources, 1985).

2.2 Data Analysis

2.2.1 Aggregation of Sample Plot Data

Vegetation data were grouped by species composition according to the tabular method described by Mueller-Dombois and Ellenberg (1974). Plots having similar species composition and cover were grouped into plant associations, which were named according to the dominant species in one or more of the layers (e.g. the Aspen/Buffalo-berry association

has trembling aspen as the dominant tree and buffalo-berry as the dominant shrub). Environment data were aggregated by plot according to the groups defined through vegetation classification. Refinement of the classification was an iterative process involving minor reorganization of plot data. The objective of this process was to define plant associations that were different from each other in terms of both species cover and composition, and environmental factors.

This stage of data analyses was conducted using vegetation, tree mensuration and environment programs run through the University of Alberta's mainframe computer facilities. A brief description of each program and information it generates is given in Appendix 1 of this volume.

2.2.2 Statistical Analyses

Statistical analyses were used to compare site productivity between the associations established through aggregation of sample plot information. Mean, standard deviation, and range about the mean at 70 per cent confidence levels were calculated for mensuration data; these calculations were performed on data from each of the plot groupings used to define the associations.

It should be noted that at least one major assumption regarding statistical analysis is not met, namely that sampling be unbiased. In the strict sense, only randomly selected data samples should be used. From an operational viewpoint, however, access problems and the necessity of sampling all major variations in the study area within a relatively short period of time makes random sampling impractical.

The concept of plot selection used in the Kimiwan-Winagami study is similar to that advocated by Mueller-Dombois and Ellenberg (1974) - "subjective without preconceived bias." That is, plots were not consciously located within communities which represented the investigators' opinion of what "should" be found in a given place. Nevertheless, some bias is unavoidable and, especially when taken together with small sample sizes, might still affect results to a significant degree. The statistical analyses reported in Section 5 of this volume should therefore be used only as indicators of general trends and should not be interpreted too strictly.

3. PLANT ASSOCIATION DESCRIPTIONS

This section describes 10 terrestrial plant associations occurring in the Kimiwan-Winagami study area. Plot data from 53 sample plots were analysed and grouped to derive these associations according to methods described in the previous section. Association descriptions are presented below and include a summary of vegetation and environmental characteristics. The name assigned to each association indicates those species which are considered most representative of the association. Plants occurring in different layers are separated by a slash (/), species within the same layer are separated by a dash (-).

Environment characteristics included in the summaries are those judged to exert the largest effect on plant community development. The edatopic grids provided for each association graphically portray the range of soil moisture and nutrient conditions within which the association can be expected to occur.

The vegetation summary for each association includes a list of plant species and a summary of stand characteristics. The plant species listed are considered characteristic of the association being discussed and are usually constant, that is, occurring in more than 60 per cent of sampled plots. The letter "d" following some of the species names means that the indicated species occurs with greater

abundance than other species, and always with more than five percent foliar cover. These species are referred to as dominant in the accompanying text by virtue of their abundance relative to other species[1]. Stand characteristics include the average height, age, stem diameter and stem density of trees in the main canopy. Detailed vegetation, environment and mensuration information used in preparing the summaries is provided in Appendix 1 of this volume. Scientific and common names of all vascular and non-vascular plants encountered during this study are recorded in Appendix 1, following the Summary Vegetation Tables.

An identification key (Table 3.1) accompanies this section of Volume II. This key is intended to assist the user in assigning communities delineated in the field to the most appropriate association, and can be used like any ordinary taxonomic key (e.g. Moss 1983).

---

[1] In the strict sense, dominance is attributed to organisms that have a significant effect on the community (Odum, 1971, p. 141). As the term is used differently here, this may or may not be true.

Table 3.1

KEY TO PLANT ASSOCIATIONS OF THE KIMIWAN-WINAGAMI STUDY AREA

Guidelines for Use

(1) Use this key for stands that have not been severely disturbed recently by fire, logging, cultivation, grazing, etc. and that have had sufficient time to stabilize after disturbance (20-30 years).

(2) Choose a spot that appears to be representative of the community (and landform) of interest to you.

(3) Verify that the area chosen is representative of the stand by examining the surrounding area. If not, select another plot.

(4) Using a 10 m x 10 m plot, identify and record the major plant species in each of the tree, shrub, forb, grass and moss layers (all of these might not be present at a particular site). Estimate the relative abundance of each species (in a 10 m x 10 m or 100 m^2 plot, coverage can be estimated in square metres and converted directly to per cent).

(5) Enter the key with the vegetation information collected in the plot along with appropriate environmental information (e.g. slope position, presence or absence of open water). Work through the key until you find the best match between field data and descriptions given in the key.

(6) Refer to the written descriptions within the text to verify the identification. Remember that the plant association is a composite picture of several field plots and is not likely to correspond exactly to the plant community you are examining.

1a Wetlands: Water table close to or at soil surface, on level or depressional terrain. Organic or gleysolic soils, the latter with prominent mottling. Willow, black spruce, tamarack, sedges and sphagnum moss predominate 2

1b Uplands: Water table generally >30 cm from soil surface; soils generally not wet for most of growing season. Solonetzic, Gleysolic, Luvisolic, Brunisolic soils. Aspen, balsam poplar, white spruce 4

2 Treed fens 2a

Treeless fens 3

2a Black spruce, labrador tea and feather or sphagnum mosses, relatively species-poor, very common . . . . . Black spruce/Labrador tea/Moss association (Section 3.3.1)

2b Tamarack, water sedge and moss, generally standing water at surface, near perimeters of large wetlands adjacent to upland areas . . . . . Tamarack/Sedge association (Section 3.3.3)

3 Treeless fens dominated by willow clumps interspersed with sedges or marsh reed grass. Orthic or Humic Gleysols, along lakeshores and along small stream courses (e.g. Bearhead Creek) . . . . . Willow shrubland association (Section 3.3.2)

4 Aspen and/or balsam poplar dominant 5
White spruce dominant 8

5 Balsam poplar dominant with red-osier dogwood, sarsaparilla, fireweed, horsetail and reedgrass in understory; generally on floodplains and terraces . . . . . Balsam poplar/Red-osier dogwood-Raspberry/Reedgrass association (Section 3.1.5)

Aspen and balsam poplar codominant 6
Aspen dominant 7

6 Aspen and balsam poplar codominant, stands very open, alder present (>5% cover) in understory. Moist, nutrient rich and slightly acidic sites with coarse-textured surface horizons Aspen-Balsam poplar/Alder/Fireweed-Marsh reed grass association (Section 3.1.4)

Aspen and balsam poplar codominant, stands densely stocked, alder absent on <5% cover in understory. Moist, nutrient rich, circumneutral sites with medium to fine textured surface horizons Aspen-Balsam poplar/Low-bush cranberry/Rose association (Section 3.1.3)

7 Buffalo-berry present (>20% cover and greater than either low-bush cranberry or rose). Strongly acid, fine textured glaciolacustrine materials . . . . . Aspen/Buffalo-berry association (Section 3.1.1)

Low-bush cranberry and rose dominant, slightly to moderately acid glaciolacustrine and moraine materials, fine textured . . . . . Aspen/Low-bush cranberry-Rose association (Section 3.1.2)

Reedgrass abundant (>10% cover); stands generally fairly open (<50% canopy cover); gooseberry, fireweed and willows consistently present in understory Reedgrass phase

Reedgrass sporadic (constant but <2% cover); stands generally with a closed canopy (60% cover); sarsaparilla abundant (>10% cover); gooseberry, fireweed and willows not consistently present in understory . . . . . Sarsaparilla phase

8 White spruce and aspen codominant, with low-bush cranberry and rose in understory White spruce-Aspen/ Low-bush cranberry-Rose association (Section 3.2.1)

White spruce dominant; feathermosses prevalent in understory White spruce/Low-bush cranberry-Rose/Feathermoss association (Section 3.2.2)

3.1 Deciduous Forest Associations

Deciduous forests cover more than 50 percent of the Kimiwan-Winagami study area, and exhibit highly variable stand physiognomy and composition. Two aspen-dominated associations, two aspen-balsam poplar associations and one balsam poplar association are described below, based on analyses of vegetation and environment data from 36 sites.

3.1.1 Aspen/Buffalo-berry Association (*Populus tremuloides/Shepherdia canadensis*)

Site and Soil Characteristics

Number of sample sites	:	3
Moisture regime	:	Mesic (subhygric)
Nutrient regime	:	Mesotrophic to submesotrophic
Slope position	:	Plain
Mean slope	:	2% (sample min., max = 1, 4)
Aspect	:	Variable
Mean elevation (masl)	:	624 (sample min., max = 615, 638)
Parent material	:	Glaciolacustrine
Soil texture	:	Fine textured[1]
Drainage	:	Moderately well to poor
Mean soil reaction (B horizon)	:	pH 4.7 (sample min., max = 4.0, 5.5)
Soil classification	:	Brunisolic and Solonetzic Gray Luvisols, Orthic Luvic Gleysols

The Aspen/Buffalo-berry association is relatively uncommon in the study area. Communities belonging to this association occur on fine-textured glaciolacustrine materials with level to subdued hummocky surface expression and have developed in association with Gray Luvisols on moderately well drained sites and Luvic Gleysols on poorly drained sites. This association can probably be expected on morainal parent materials as well.

---

[1] Texture classes are taken from the Canada System of Soil Classification (Canada Soil Survey Committee 1976).

Soil pH in the rooting zone is moderately to strongly acidic (pH 4.0-5.5), and sampled sites were judged to be mesic and submesotrophic (moderately well supplied with water and relatively nutrient-poor, respectively). Figure 3.1 shows the range of moisture and nutrient conditions within which communities belonging to this association were observed to occur.

Vegetation

Characteristic Species

Tree Layer	**Populus tremuloides**(d)	Trembling aspen
	Picea glauca	White spruce
Shrub Layer	**Shepherdia canadensis** (d)	Buffalo-berry
	Rosa acicularis	Prickly rose
	Viburnum edule	Low-bush cranberry
	Populus tremuloides	Trembling aspen
	Amelanchier alnifolia	Saskatoon
	Cornus stolonifera	Red-osier dogwood
	Lonicera dioica	Twining honeysuckle
	Ribes oxyacanthoides	Wild gooseberry
	Symphoricarpos albus	Snowberry
Forb Layer	**Linnaea borealis**	Twinflower
	Epilobium angustifolium	Fireweed
	Aralia nudicaulis	Sarsaparilla
	Fragaria virginiana	Wild strawberry
	Galium boreale	Northern bedstraw
	Maianthemum canadense	Two-leaved Solomon's-seal
	Vicia americana	Wild vetch
	Rubus pubescens	Dewberry
	Cornus canadensis	Bunchberry
	Pyrola asarifolia	Common pink wintergreen
	Lathyrus ochroleucus	Peavine
Grass and Graminoid Layer	**Calamagrostis canadensis**	Marsh reed grass
Mosses and Lichens on Humus		No constant species

Mosses and Lichens on Trees and Shrubs	**Pylasiella polyantha** **Physcia adscendens** **Xanthoria polycarpa**

Stand Characteristics

Mean canopy height	:	16.7 m (sample min., max. = 15. 19)
Mean stem diameter @ 1.3 m	:	17.7 cm (sample min., max = 15.6, 21.0)
Mean stand age	:	69 yr. (sample min., max. = 60, 79)
Mean stem density (total live stems/ha)	:	865 (sample min., max. = 800, 970)
Mean canopy cover	:	45% (sample min., max. = 800, 970)

Maturing stands of trembling aspen with a well developed canopy are characteristic of the Aspen/Buffalo-berry association. White spruce is frequently present but with low cover. Buffalo-berry is the most abundant species in the well developed low shrub stratum, and low-bush cranberry and wild rose are constant associates with relatively high cover. Other shrubs, such as saskatoon, red osier dogwood, and gooseberry are constant species with low cover.

Total cover in the forb layer is generally less than that of the shrub layer. Sarsaparilla is constant and dominant at sample sites. Several other species including twinflower, fireweed and dewberry are constant species with low cover. Marsh reed grass is prevalent in the grass and graminoid layer. **Pylasiella polyantha** is a common moss, often covering the bases of aspen trees.

3.1.2 Aspen/Low-bush cranberry-Rose Association (**Populus tremuloides/Viburnum edule-Rosa spp.**)

Two phases of this association have been identified and differentiated on the basis of mean canopy cover and understory composition; the Aspen/Low-bush cranberry-Rose/Reedgrass phase and the

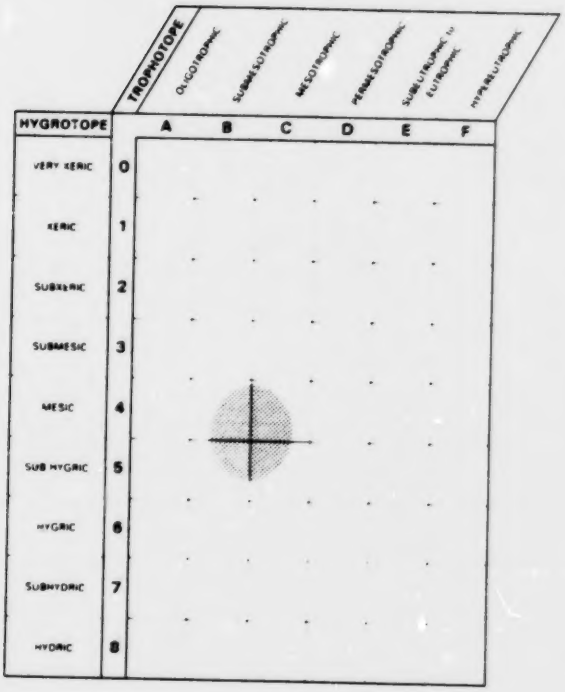

Fig. 3.1. Edatopic Grid: Aspen/Buffalo-berry Association

Aspen/Low-bush cranberry-Rose/Sarsaparilla phase. The summary of site and soil characteristics given below applies to both phases of this association; however, each phase will be discussed separately with respect to vegetation.

Site and Soil Characteristics

Number of sample sites	:	22
Moisture regime	:	Mesic on moraine; mesic to subhygric on glaciolacustrine
Nutrient regime	:	Mesotrophic (submesotrophic) on moraine; mesotrophic to permesotrophic on glaciolacustrine
Slope position	:	Plain
Mean slope	:	3% (sample min., max., = 0, 7)
Aspect	:	Variable
Mean elevation (masl)	:	631 (sample min., max., = 612, 701)
Parent material	:	Glaciolacustrine, glaciolacustrine veneers and blankets over moraine, moraine
Soil texture	:	Moderately fine to very fine textured
Drainage	:	Moderately well to well on moraine; moderately well to well (imperfect) on glaciolacustrine
Mean soil reaction (B soil horizon)	:	pH 5.5-6.5 on glaciolacustrine (sample min., max = 4.5-7.5) and 5.0-5.5 on moraine (sample min., max., = 4.0, 7.0)
Soil classification	:	Orthic Luvic Gleysols and Orthic Gray Luvisols on glaciolacustrine; Orthic and Solonetzic Gray Luvisols, Solodized Solonetzic and Gray Solods on moraine.

The Aspen/Low-bush cranberry-Rose association is prevalent on upland sites throughout the study area. Communities belonging to this association occur on moderately fine to fine textured glaciolacustrine and morainal parent materials with inclined and generally subdued undulating surface expression. Orthic Luvic Gleysols are associated with poorly drained glaciolacustrine materials, and Orthic Gray Luvisols occur on moderately well to well drained glaciolacustrine and morainal materials. Solonetzic Gray Luvisols, Solods, and Solodized Solonetzes are common on morainal materials and occur infrequently on glaciolacustrine deposits.

Soil pH in the rooting zone is somewhat more acidic on average for morainal materials (pH 5.0-5.5) than on glaciolacustrine deposits

(pH 5.5-6.5). Mean soil pH in the rooting zone is slightly more acidic for sites belonging to the reedgrass phase of this association (pH 5.4) as compared to the sarsaparilla phase (pH 6.3). Generally, sites on glaciolacustrine materials were judged to be somewhat moister and better supplied with nutrients (mesic-subhygric, meso-permesotrophic) than sites on moraine (mesic, mesotrophic). Figure 3.2 shows the range of moisture and nutrient conditions within which communities belonging to this association were observed to occur.

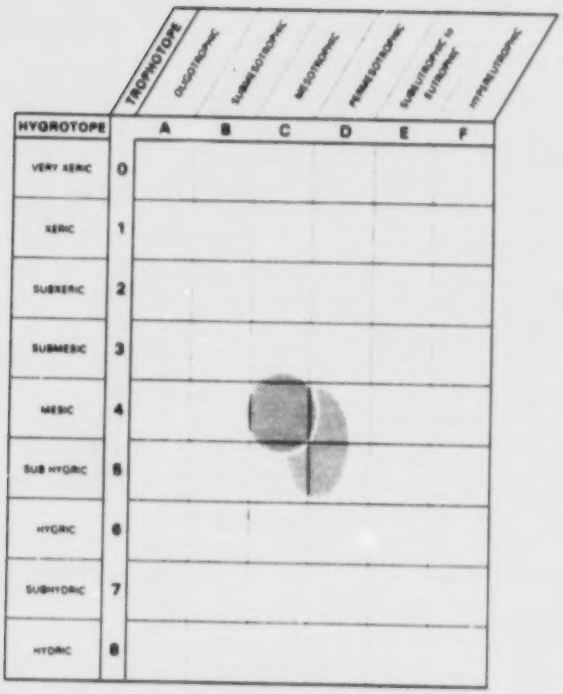

Fig. 3.2. Edatopic Grid: Aspen/Low-bush cranberry-Rose Association
---------- morainal parent materials
_____ glaciolacustrine parent materials

Vegetation: Aspen/Low-bush cranberry-Rose association, reedgrass phase (n = 12)

Characteristic Species

Tree Layer	**Populus tremuloides** (d)	Trembling aspen
Shrub Layer	**Salix bebbiana**	Bebb willow
	Rosa acicularis (d)	Prickly rose
	Viburnum edule (d)	Low-bush cranberry
	Amelanchier alnifolia	Saskatoon
	Symphoricarpos albus	Snowberry
	Rubus idaeus	Raspberry
	Lonicera dioica	Twining honeysuckle
	Lonicera involucrata	Bracted honeysuckle
	Populus tremuloides	Trembling aspen
	Cornus stolonifera	Red-osier dogwood
	Ribes oxyacanthoides	Gooseberry
	Shepherdia canadensis	Buffalo-berry
Forb Layer	**Rubus pubescens**	Dewberry
	Cornus canadensis	Bunchberry
	Lathyrus ochroleucus	Peavine
	Galium boreale	Northern bedstraw
	Aster conspicuus	Showy aster
	Epilobium angustifolium	Fireweed
	Vicia americana	Vetch
	Aralia nudicaulis	Sarsaparilla
	Linnaea borealis	Twinflower
	Fragaria virginiana	Strawberry
	Pyrola asarifolia	Common pink winter-green
Grass and Graminoid Layer	**Calamagrostis canadensis** (d)	Marsh reed grass
Moss and Lichens on Humus		No constant or dominant species
Mosses and Lichens on Trees and Shrubs	**Pylaisiella polyantha**	

Stand Characteristics

Mean canopy height	:	17.6 m (sample min., max. = 12, 22)
Mean stem diameter @ 1.3 m	:	15.7 cm (sample min., max. = 9.6, 29.0)
Mean stand age	:	61 (sample min., max. = 34, 131)
Mean stem density (total live stems/ha)	:	1 855 (sample min., max. = 275, 3 500)
Mean canopy cover	:	45% (sample min., max. = 25, 70)

Stands belonging to the Aspen/Low-bush cranberry-Rose/Reedgrass phase are dominated by generally young to mid-seral trembling aspen with a relatively open canopy. Older stands may be two-aged, with a very open, lightly stocked overmature aspen overstory and a young, lightly stocked aspen understory. Older stands in particular exhibit rather patchy stocking and have a tree canopy which is vertically ill-defined. White spruce is consistently present in the tree and shrub strata occurring with low cover on scattered trees or small clumps. Bebb willow is a constant and prevalent species in the tall shrub layer (2.5-5 m). Prickly rose and low-bush cranberry are codominant species in a well developed low shrub stratum; saskatoon is consistently present with significant (>5%) cover. Red osier dogwood and bracted honeysuckle appear to be more strongly correlated with glaciolacustrine materials than with moraine, perhaps because of the slightly moister and richer conditions associated with the former. Gooseberry is more strongly correlated with imperfectly to poorly drained soils than with soils having better drainage on both glaciolacustrine and morainal deposits.

The forb layer is comprised of a number of constant species, none of which are consistently present with high enough cover to be termed dominant. Dewberry, bunchberry and peavine are ubiquitous. Fireweed is constant and may be locally dominant under lightly stocked stands with open canopies and concomitantly high light levels. Pink wintergreen and two-leaved Solomon's seal appear to associate more with sites on moraine than sites on glaciolacustrine materials. Insufficient data was collected to speculate reasonably upon the

significance of this relationship, however.

The grass and graminoid layer is moderately well developed and dominated by marsh reedgrass which generally occurs with cover of 10 percent or better. The relatively open canopy and adequate moisture status of sites belonging to this phase may provide favorable conditions for the growth of this species.[1] **Pylaisiella polyantha** is a common moss, often covering the bases of aspen trees.

Vegetation: Aspen/Low-bush cranberry-Rose/Sarsaparilla phase (n = 10)

Characteristic Species

Tree Layer	**Populus tremuloides** (d)	Trembling aspen
Shrub Layer	**Rosa acicularis/woodsii** (d)	Prickly rose/ Common wild rose
	Viburnum edule (d)	Low-bush cranberry
	Amelanchier alnifolia	Saskatoon
	Rubus idaeus	Raspberry
	Symphoricarpos albus	Snowberry
	Lonicera involucrata	Bracted honeysuckle
	Cornus stolonifera	Red-osier dogwood
	Shepherdia canadensis	Buffalo-berry
Forb Layer	**Aralia nudicaulis** (d)	Sarsaparilla
	Rubus pubescens	Dewberry
	Lathyrus ochroleucus	Peavine
	Cornus canadensis	Bunchberry
	Galium boreale	Northern bedstraw
	Linnaea borealis	Twinflower
	Vicia americana	Vetch
	Fragaria virginiana	Strawberry

[1] This relationship has been noted elsewhere (Watson et al. 1980; Downing 1983). The consistent occurrence of Bebb willow may be a further indication of relatively high light levels in the understory, as this species is reported to have low to moderate shade tolerance (Watson et al. 1980).

	Maianthemum canadense	Two-leaved Solomon's seal
	Pyrola asarifolia	Pink winterygreen
Grass and Graminoid Layer	**Calamagrostis canadensis**	Marsh reed grass
Mosses and Lichens on Humus		No constant species
Mosses and Lichens on Trees and Shrubs	**Pylaisiella polyantha** **Xanthoria polycarpa** **Physica adscendens**	

Stand Characteristics

Mean canopy height	:	17.6 m (sample min., max., 12, 22)
Mean stem diameter @ 1.3 m	:	14.7 cm (sample min., max., = 9.8, 20.2)
Mean stand age	:	53 yr. (sample min., max. = 34, 133)
Mean stem density (total live stems/ha)	:	2 100 (sample min., max. = 935, 3 600)
Mean canopy cover	:	60% (sample min., max. = 50, 70)

Stands belonging to the Aspen/Low-bush cranberry-Rose/Sarsaparilla phase are dominated by young to mid-seral trembling aspen with a well developed canopy. White spruce is consistently present in the tree layer. There are no constant shrub species in the tall shrub layer. Low-bush cranberry and wild rose are codominant in a moderately well developed low shrub stratum. The forb layer is quite diverse and, generally, sarsaparilla is clearly the dominant species. Marsh reedgrass is the only consistently occurring component of a poorly developed grass and graminoid layer, and generally occurs with cover of one to five percent. Lichens (**Xanthoria polycarpa, Physcia adscendens**) commonly occur on aspen bark, and the moss **Pylaisiella polyantha** is common at the base of aspen trees.

The sarsaparilla phase appears to differ from the reedgrass phase as follows:

1. Tree canopy cover is lower and the tree stratum is generally less well defined vertically in the reedgrass phase.

2. Shrub diversity is higher in the reedgrass phase than in the sarsaparilla phase, and both the tall and low shrub strata are better developed in the former.

3. Some species which are constant in the reedgrass phase are not consistently present in the sarsaparilla phase, or are constant with much lower cover. A comparative list is given below.

Species	Reedgrass Phase	Sarsaparilla Phase
Salix bebbiana	Constant	Not constant
Amelanchier alnifolia	Constant, cover $\geq$5%	Constant, cover <5%
Cornus stolonifera	Constant, cover often >5% but <10%	Constant, cover generally $\leq$2%
Lonicera dioica	Constant	Not constant
L. involucrata	Constant, often >3%	Constant, usually 1-2%
Populus tremuloides (shrub layer)	Constant	Not constant
Ribes oxyacanthoides	Constant	Not constant
Aster conspicuus	Constant	Not constant
Aralia nudicaulis	Constant, <2% cover	Constant, >10% cover
Calamagrostis canadensis	Constant, >10% cover	Constant, <5% cover

Many of the shrub, forb and grass species which are constant in the reedgrass phase but not in the sarsaparilla phase are regarded as somewhat shade intolerant (e.g. Bebb willow, fireweed, marsh reed grass (Watson et al. 1980)). This is not surprising given that the lower canopy cover and

generally more uneven canopy physiognomy of the reedgrass phase probably admit more light to the understory.

4. As noted in the environmental description, soil reaction in the rooting zone is more acidic in the reedgrass phase. Because soil textures (and presumably cation exchange capacity) are similar betwen the two phases, percent base saturation and therefore the availability of basic cation (e.g. Ca^{+2}, Mg^{+2}), might be lower in the reedgrass phase.

It may be difficult to distinguish either phase of the Aspen/Low-bush cranberry-Rose association from the Aspen/Buffalo-berry association described previously, particularly when either low-bush cranberry or rose occur with the same cover as buffalo-berry. Assignment of individual plots to the appropriate association was sometimes quite arbitrary. Where buffalo-berry cover exceeded 20 percent, the plot was assigned to the Aspen/Buffalo-berry association.

3.1.3 Aspen-Balsam poplar/Low-bush cranberry-Rose Association (**Populus tremuloides-P. Balsamifera/Viburnum edule-Rosa**)

Site and Soil Characteristics

Number of sample sites	:	6
Moisture regime	:	Subhygric
Nutrient regime	:	Permesotrophic
Slope position	:	Plain
Mean slope	:	2.3% (sample min., max. = 1, 4)
Aspect	:	Variable
Mean elevation (masl)	:	632 (sample min., max. =
Parent material	:	Undulating and inclined glaciolacustrine and morainal deposits

Soil texture	:	Medium to fine-textured
Drainage	:	Well to poor
Mean soil reaction (rooting zone)	:	pH 7.1 (sample min., max. = 6.5, 8.0)
Soil classification	:	Orthic Eutric Brunisol, Orthic Gray Luvisol, Gleyed Gray Luvisol, Orthic Luvic Gleysol

The Aspen-Balsam poplar/Low-bush cranberry-Rose association is common but less areally extensive in the study area than the Aspen/Low-bush cranberry-Rose association. Communities belonging to this association occur on medium to fine textured glaciolacustrine and morainal materials with subdued undulating and inclined surface expressions. Orthic Luvic Gleysols and Gleyed Gray Luvisols are associated with poorly to imperfectly drained conditions, and Brunisols and Gray Luvisols occur on moderately well to well drained sites. Sites were judged to be subhygric and permesotrophic; seepage was noted at one site. Neutral to alkaline soil reaction provide some indication that nutrients, particularly exchangeable bases, are readily available. Figure 3.3 shows the range of moisture and nutrient conditions within which communities belonging to this association were observed to occur.

Vegetation

Characteristic Species

Tree Layer	**Populus tremuloides** (d)	Trembling aspen
	Populus balsamifera (d)	Balsam poplar
Shrub Layer	**Salix bebbiana**	Bebb willow
	Rosa acicularis (d)	Prickly rose
	Viburnum edule (d)	Low-bush cranberry
	Cornus stolonifera	Red-osier dogwood
	Rubus idaeus	Raspberry
	Ribes oxyacanthoides	Gooseberry
	Symphoricarpos albus	Snowberry

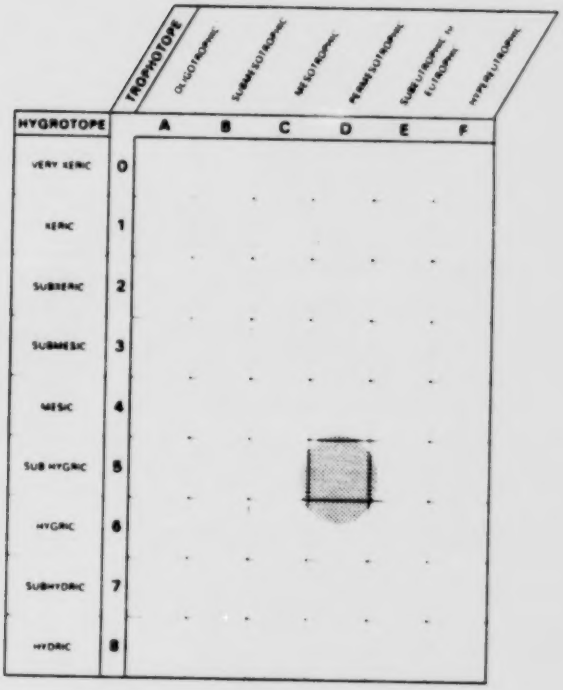

Fig. 3.3. Edatopic Grid: Aspen-Balsam poplar/Low-bush cranberry-Rose Association

Forb Layer	**Cornus canadensis**	Bunchberry
	Rubus pubescens	Dewberry
	Linnaea borealis	Twinflower
	Epilobium angustifolium	Fireweed
	Lathyrus ochroleucus	Peavine
	Petasites palmatus	Palmate-leaved coltsfoot
	Aralia nudicaulis	Sarsaparilla
	Fragaria virginiana	Strawberry
	Vicia americana	Vetch
	Pyrola asarifolia	Common pink wintergreen

	Galium boreale	Northern bedstraw
	Maianthemum canadense	Two-leaved Solomon's seal
	Mertensia paniculata	Tall mertensia
Grass and Graminoid Layer	**Calamagrostis canadensis**	Marsh reed grass
Moss and Lichens on Humus		No constant species
Mosses and Lichens on Trees and Shrubs	**Pylaisiella polyantha**	

Stand Characteristics

Mean canopy height	:	14.7 m (sample min., max. = 13. 16)
Mean stem diameter @ 1.3 m	:	10.8 cm (sample min., max. = 9.4, 12.4)
Mean stand age	:	44 yr. (sample min., max = 37, 50)
Mean stem density (total live stems/ha)	:	2 600 (sample min., max. = 1 400, 3 100)
Mean canopy cover	:	55% (sample min., max. = 30, 60)

Young, densely stocked stands composed of trembling aspen and balsam poplar, and having a well developed canopy characerize the tree layer of this association. White spruce is not a constant species and is generally present with very low cover (<2%) in the low shrub stratum. Bebb willow is the only constant species of a discontinuous tall shrub layer. Prickly rose and low-bush cranberry are codominant in a variable low shrub stratum. Red-osier dogwood may be locally abundant, and gooseberry appears to be correlated with imperfectly to poorly drained soils.

The forb layer is diverse and well developed. Twinflower and bunchberry are constant and usually occur with cover of five percent or more. However, sarsaparilla or fireweed are locally dominant at some sites. The grass and graminoid layer is poorly developed with marsh reed grass as the only constant species. The

moss **Pylaisiella polyantha** is common, often covering the bases of aspen and balsam trees.

3.1.4 Aspen-Balsam poplar/Alder spp./Fireweed-Marsh reed grass Association (**Populus tremuloides-P. balsamifera/Alnus spp./Epilobium angustifolium-Calamagrostis canadensis**)

Site and Soil Characteristics

Number of sample sites	:	4
Moisture regime	:	Subhygric
Nutrient regime	:	Permesotrophic
Slope position	:	Plain
Mean slope	:	6% (sample min., max. = 0, 11)
Aspect	:	Variable
Mean elevation (masl)	:	665 (sample min., max. = 639, 711)
Parent material	:	Inclined and undulating, slightly to moderately stony moraine (glaciolacustrine)
Soil texture	:	Moderately coarse to coarse (upper profile), moderately fine to fine (lower profile)
Drainage	:	Moderately well to well (imperfect)
Mean soil reaction (B horizon)	:	pH 5.2 (sample min., max. = 4.5, 5.5)
Soil classification	:	Solonetzic, Brunisolic and Gleyed Dark Gray Luvisols, Orthic Regosol

Communities belonging to this association occur on slightly stony inclined and undulating moraine or glaciolacustrine materials. Moderately acid Gray Luvisolic and Regosolic soils have developed under mainly well to moderately well drained conditions. Soil textures are moderately coarse to coarse in the upper 15-20 cm, and moderately fine to very fine lower in the profile. Sites were judged to be permesotrophic and subhygric. Figure 3.4 shows the range of moisture and nutrient conditions within which communities belonging to this association were observed to occur.

Vegetation

Characteristic Species

Tree Layer	**Populus tremuloides** (d)	Trembling aspen
	P. balsamifera (d)	Balsam poplar
Shrub Layer	**Alnus crispa,**	Green alder
	A. tenuifolia (d)	River alder
	Rosa acicularis (d)	Prickly rose
	Rubus idaeus	Raspberry
	Viburnum edule (d)	Low-bush cranberry
	Amelanchier alnifolia	Saskatoon
	Lonicera involucrata	Bracted honeysuckle
	Ribes triste	Wild red currant
	Symphoricarpos albus	Snowberry
	Picea glauca	White spruce
	Populus tremuloides	Trembling aspen
Forb Layer	**Epilobium angustifolium** (d)	Fireweed
	Aralia nudicaulis	Sarsaparilla
	Rubus pubescens	Dewberry
	Galium boreale	Northern bedstraw
Grass and Graminoid Layer	**Calamagrostis canadensis** (d)	Marsh reed grass
Mosses and Lichens on Humus	No constant species	
Mosses and Lichens on Trees and Shrubs	**Pylaisiella polyantha**	

Stand Characteristics

Mean canopy height	:	26 m (sample min., max. = 24, 28)
Mean stem diameter @ 1.3 m	:	29.4 cm (sample min., max. = 16.8, 38.6)
Mean stand age	:	106 (sample min., max. = 86, 126)
Mean stem density (total live stems/ha)	:	330 (sample min., max. - 275, 450)
Mean canopy cover	:	30% (samle min., max. = 20, 40)

Open stands of overmature, lightly stocked codominant aspen and balsam poplar with a poorly defined canopy and very low stocking density characterize the Aspen-Balsam poplar/Alder/Fireweed-Reedgrass

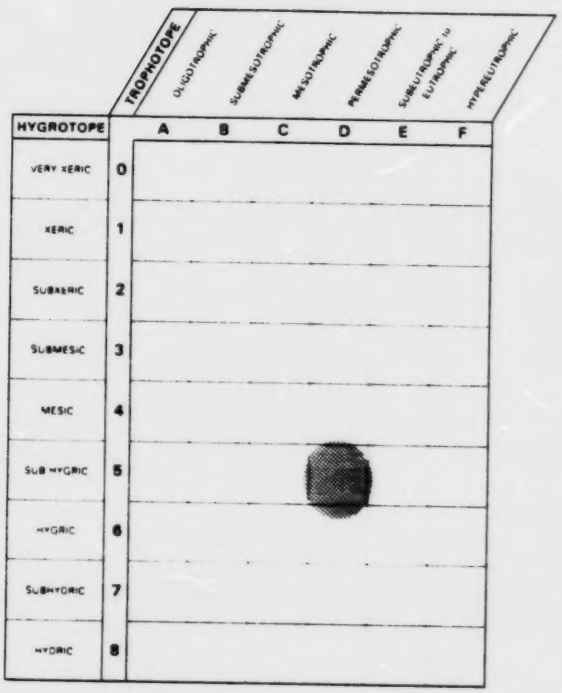

Fig. 3.4. Edatopic Grid: Aspen-Balsam poplar/Alder spp./Fireweed-Marsh reed grass Association

association. Scattered white spruce occur in the tree and shrub layers. Green alder or river alder are prevalent in the tall shrub layer. Prickly rose and low-bush cranberry dominate the well developed low shrub layer; raspberry is constant and may occur with high cover.

The forb layer is not as well developed as the shrub layer. Fireweed is the only forb species which occurs with consistently high cover. The grass and graminoid layer is highly variable, and marsh reed grass is the only constant grass species generally occurring with greater than 10 percent cover. The moss **Pylaisiella polyantha** often covers the bases of aspen and balsam poplar trees.

Stand history probably has a major effect on vegetative structure and composition. As the stands age, the proportions of aspen and balsam poplar may change because of differential mortality; whereas the life span of aspen does not usually exceed 120 years, balsam poplar may attain 135 years (Moss 1955). Without a nearby seed source, white spruce regeneration is extremely slow, and consequently with increasing age and mortality the canopy opens. As discussed previously, the more open canopy allows relatively shade-intolerant species such as fireweed and reedgrass to flourish.

3.1.5 Balsam poplar/Red osier dogwood-Raspberry/Reedgrass Association (**Populus balsamifera/Cornus stolonifera-Rubus idaeus/ Calamagrostis canadensis**)

Site and Soil Characteristics

Number of sample sites	:	1
Moisture regime	:	Subhygric
Nutrient regime	:	Permesotrophic
Slope position	:	Fluvial terrace
Mean slope	:	0
Aspect	:	
Mean elevation (masl)	:	593
Parent material	:	Fluvial
Soil texture	:	Moderately coarse
Drainage	:	Well
Mean soil reaction (rooting zone)	:	pH 6.5-7.0
Soil classification	:	Humic Regosol

This association has a very limited distribution in the study area, and was only seen on fluvial terraces along the South Heart River. Well drained, moderately coarse and recently deposited fluvial materials with limited soil development (Regosols), moist and rich site conditions, and circumneutral soil reaction are characteristically associated with similar plant community types elsewhere in the Boreal Mixedwood ecoregion (Brierley et al. 1985; Kocaoglu and Bennett 1983, Bishoff (revised 1984)). Figure 3.5 shows the range of moisture conditions within which communities belonging to this association might be expected to occur.

Vegetation

Important Species[2]

Tree Layer	**Populus balsamifera** (d)	Balsam poplar
Shrub Layer	**Rubus idaeus**	Raspberry
	Cornus stolonifera (d)	Red-osier dogwood
	Rosa acicularis	Prickly rose
Forb Layer	**Aralia nudicaulis** (d)	Sarsaparilla
	Epilobium angustifolium (d)	Fireweed
	Equisetum spp. (d)	Horsetail
Grass and Graminoid Layer	**Calamagrostis canadensis** (d)	Marsh reed grass
Mosses and Lichens on Humus	None noted	
Mosses and Lichens on Trees and Shrubs	Several species, on bark	

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[2] Because of the sample size (n=1) further sampling is necessary to define what species would be characteristic of the Balsam poplar/Red-osier dogwood-Raspberry/Reedgrass association in this area of the province. The abovementioned species appear to be important components of this association, and are comparable to those of similarly named types cited in other studies of northern Alberta vegetation (Brierley et al. 1985, Kocaoglu and Bennett 1983; Bishoff (revised 1984)).

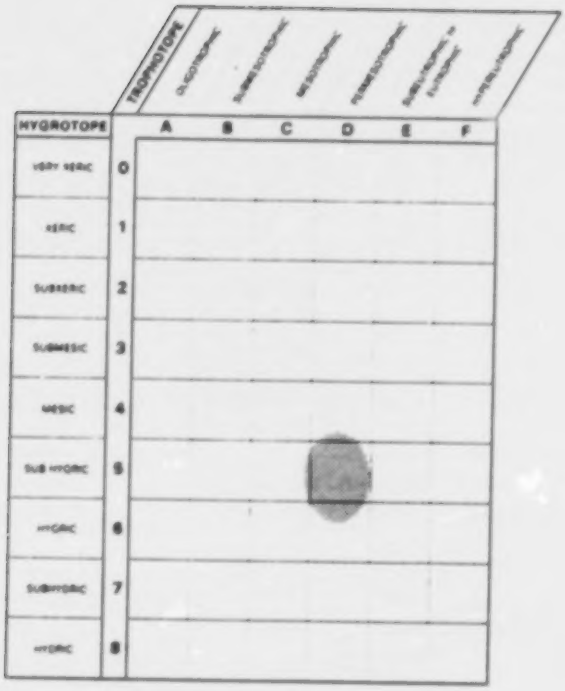

Fig. 3.5. Edatopic Grid: Balsam poplar/Red-osier dogwood-Raspberry-Reedgrass Association

Stand Characteristics

Canopy height	:	23 m (one sample)
Stem diameter @ 1.3 m	:	30.8 (one sample)
Stand age	:	86 yr. (one sample)
Stem density (total live stems/ha)	:	425 (one sample)
Canopy cover	:	40% (one sample)

Open, maturing stands of balsam poplar characterize the tree layer of this association. Red osier dogwood, raspberry and rose are common in an open shrub canopy. The forb layer is very well developed, with sarsaparilla, fireweed and horsetail as codominant species. Marsh reed grass is prevalent in the grass and graminoid layer.

3.1.6 Discussion: Deciduous Forest Associations

The aspen and aspen-balsam poplar dominated associations of the Kimiwan-Winagami study area are primarily of fire origin, and represent different stages in an eventual succession, barring disturbance, to a white spruce climax. Provided that fire is not intense enough to destroy aspen roots, or conditions permit the germination of aspen seed, recolonization of burned areas by aspen is likely to be rapid. Subsequent development of the understory depends upon the survival and successful growth of plant propagules in the soil of the burned area, ingress and successful germination and growth of seeds, spores, etc. from adjacent land, existing environmental conditions, and density of aspen regeneration. With time, natural thinning modifies stand composition and structure; the tree canopy opens, stem density decreases, and the proportion of aspen to balsam poplar might decline in mixed stands. With the more open canopy, more light is admitted to the understory, allowing improved growth of relatively shade-intolerant shrub, forb and grass species. As a result, if stands escape fire for long periods of time, the understory can be significantly different than in the initial stages of regeneration. Under the oldest and most open stands, environmental conditions are sometimes suitable for the

development of lightly stocked aspen or aspen-balsam poplar stands underneath the main canopy.

Stand history and environmental factors have both contributed to the development of aspen and aspen-balsam poplar associations with somewhat different understories. These associations may be placed into one of two groups.

The first group is characterized by moderately moist (mesic) sites that are moderately well supplied with nutrients (mesotrophic), and includes the Aspen/Buffalo-berry association and both phases of the Aspen/Low-bush cranberry-Rose association. The Aspen/Buffalo-berry association occurs on somewhat more acidic soils than the Aspen/Low-bush cranberry-Rose association, suggesting that soil nutrients might be more limiting on the former.[3] The primary criterion for separating these associations, however, is the relative proportion of buffalo-berry to low-bush cranberry and rose, which are all constant species in both. The ecological significance of buffalo-berry vs low-cranberry-rose dominated strata is not known, although proportional differences might be related to site and stand differences between the two associations.

The second group is characterized by moist (subhygric), rich (permesotrophic) sites and includes the Aspen-Balsam poplar/Low-bush

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[3] Forest productivity data (Section 5, this report) lend support to this hypothesis. However, further sampling of communities with shrub understories dominated by buffalo-berry is necessary to adequately delineate environmental differences.

cranberry-rose, Aspen-Balsam poplar/Alder spp./Fireweed-Reedgrass, and Balsam poplar/Red-osier dogwood associations. The Aspen-Balsam poplar associations occur on moderately well to imperfectly drained morainal and glaciolacustrine materials, while the Balsam poplar/Red-osier dogwood association may be restricted to fluvial deposits within the study area. Succession to white spruce from deciduous forest communities is likely to occur in the absence of fire or other disturbances, but at a slow rate. Although white spruce was usually present under deciduous stands, trees were widely scattered and usually not mature enough to produce seed. There may be several reasons for poor white spruce regeneration.

1. Distance from seed source, which is generally regarded as a highly important determinant of natural regeneration.

2. Recurring fires which encourage aspen suckering but destroy white spruce seedlings.

3. Smothering of white spruce seedlings by litter.

4. Edaphic conditions (such as a thick litter layer which dries before the root radicle can reach mineral soil, or compact mineral surface horizons which retard root penetration and dry rapidly.

5. Competition for light, water and nutrients from other understory plants, which has been implicated in almost every study of white spruce regeneration as a major factor in regeneration success (Dobbs, 1972).

3.2 Coniferous Forest Associations

Conifer-dominated forests are not as extensive as deciduous forests in the study area, but occur over a significant portion of upland landscapes north of Kimiwan Lake and south of the Heart River Dams. Smaller stands also occur along the South Heart River and adjacent to Winagami Lake. One white spruce-aspen association and one white spruce association are described below based on analyses of vegetation and environment data from 12 sites.

3.2.1 White spruce-Aspen/Low-bush cranberry-Rose Association (*Picea glauca-Populus tremuloides/Viburnum edule-Rosa spp.*)

Site and Soil Characteristics

Number of sample sites	:	6
Moisture regime	:	Mesic (glaciolacustrine) to subhygric (moraine)
Nutrient regime	:	Mesotrophic to permesotrophic
Slope positon	:	Plain
Mean slope	:	1.8% (sample min., max. = 0, 5)
Aspect	:	Variable
Mean elevation (masl)	:	641 (sample min., max. = 618, 681)
Parent material	:	Undulating to inclined glaciolacustrine, moraine
Soil texture	:	Moderately fine-fine
Drainage	:	Moderately well to imperfect
Mean soil reaction (B horizon)	:	pH 6.0 (sample min., max. = 5.5, 6.5)
Soil classification	:	Orthic and Humic Luvic Gleysols, Gleyed, Orthic, Dark and Solonetzic Gray Luvisols

The White spruce-Aspen/Low-bush cranberry-Rose association occurs on nearly level to very gently sloping, fine-textured glaciolacustrine and slightly stony morainal materials. Morainal materials tend to be imperfectly to poorly drained, with Gleyed Gray Luvisols and Luvic Gleysols; glaciolacustrine deposits are moderately well to well drained, with Gray Luvisolic soils. Soil pH in the

rooting zone is slightly acidic. Sites were judged to be mesic (glaciolacustrine) to subhygric (moraine) and meso- to permesotrophic. Figure 3.6 shows the range of soil moisture and nutrient conditions within which communities belonging to this association were observed to occur.

Vegetation

Characteristic Species

Tree Layer	**Picea glauca** (d)	White spruce
	Populus tremuloides (d)	Trembling aspen
Shrub Layer	**Picea glauca**	White spruce
	Rosa acicularis (d)	Prickly rose
	Viburnum edule	Low-bush cranberry
	Shepherdia canadensis	Buffalo-berry
	Cornus stolonifera	Red osier dogwood
	Populus tremuloides	Trembling aspen
	Lonicera involucrata	Bracted honeysuckle
	Rubus idaeus	Raspberry
	Ribes oxyacanthoides	Gooseberry
	Ribes triste	Wild red currant
	Symphoricarpos albus	Snowberry
Forb Layer	**Linnaea borealis** (d)	Twinflower
	Cornus canadensis (d)	Bunchberry
	Rubus pubescens (d)	Dewberry
	Fragaria virginiana	Strawberry
	Galium boreale	Northern bedstraw
	Epilobium angustifolium	Fireweed
	Mitella nuda	Bishop's cap
	Petasites palmatus	Palmate-leaved coltsfoot
	Pyrola asarifolia	Common pink wintergreen
	Viola renifolia	Kidney-leaved violet
Grass and Graminoid Layer	**Calamagrostis stricta, C. canadensis**	Reed grasses
Mosses and Lichens on Humus	**Hylocomium splendens** (d)	Stair-step moss
	Pleurozium schreberi (d)	Schreber's moss

Mosses and Lichens on Trees and Shrubs	**Hypogymnia physodes** **Usnea alpina** **Parmelia sulcata**

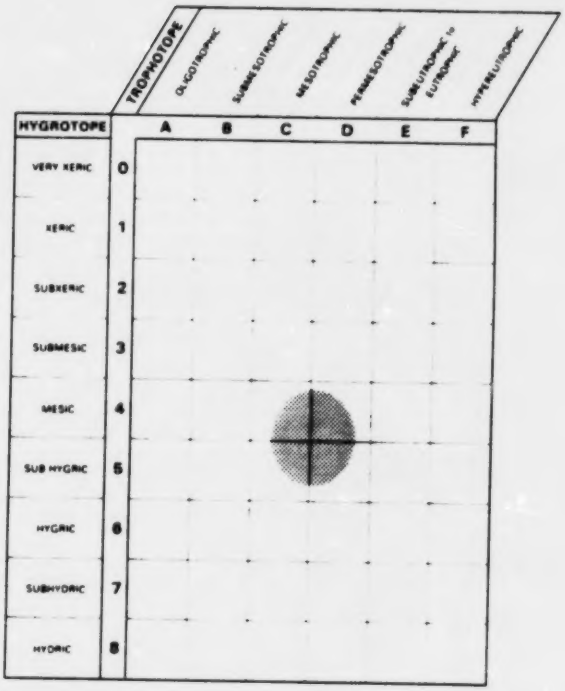

Fig. 3.6. Edatopic Grid: White spruce-Aspen/Low-bush cranberry-Rose Association

Stand Characteristics

Mean canopy height	:	25 m (sample min., max. = 22, 28 m)
Mean stem diameter @ 1.3 m	:	24.4 cm (sample min., max. = 18.0, 32.3)
Mean stand age	:	123 yr. (sample min., max. = 95, 140)
Mean stem density (total live stems/ha)	:	720 (sample min., max. = 350, 1100)
Mean canopy cover	:	40% (sample min., max. = 25, 50)

Tall, open stands of overmature trembling aspen and maturing white spruce constitute the tree layer of this association. White spruce is typically dominant. Shrub cover is discontinuous except where stands are very open. Prickly rose, buffalo-berry and low-bush cranberry are codominant. The forb layer is also discontinuous, with twinflower, bunchberry and dewberry as the major species. Reed grasses occur with very low cover and are the only constant species in the grass and graminoid stratum. Feathermosses (**Hylocomium splendens, Pleurozium schreberi**) dominate the moss layer which varies from patchy in stands with low canopy cover and high shrub cover to nearly continuous in stands with high canopy cover and comparatively low understory cover. Numerous lichens colonize the stems and branches of white spruce.

3.2.2 White spruce/Low-bush cranberry-Rose/Feathermoss Association (**Picea glauca/Viburnum edule-Rosa/Hylocomium-Pleurozium**)

Site and Soil Characteristics

Number of sample sites	:	6
Moisture regime	:	Subhygric
Nutrient regime	:	Mesotrophic to permesotrophic
Slope position	:	Plain
Mean slope	:	2.5% (sample min., max. = 0, 9)
Aspect	:	Variable
Mean elevation (masl)	:	645 (sample min., max. = 615, 723)
Parent material	:	Inclined to undulating glaciolacustrine and morainal materials

Soil texture	:	Moderately fine to very fine
Drainage	:	Poor
Mean soil reaction (B horizon)	:	pH 6.0 (sample min., max. = 5.5, 8.0)
Soil classification	:	Orthic Luvic Gleysol

The White spruce/Low-bush cranberry-Rose/Feathermoss association occurs throughout the study area, but is most prevalent within portions of the Bearhead and Falher Plain physiographic districts north of Kimiwan Lake and south of the Heart River Dams. Poorly drained Orthic Luvic Gleysols predominate on fine textured glaciolacustrine and slightly stony morainal materials. Soil pH is moderately acid, and sites were all judged to be subhygric and mesotrophic to permesotrophic. Seepage was noted at two of six plots. Figure 3.7 shows the range of soil moisture and nutrient conditions within which communities belonging to this association were observed to occur.

Vegetation

Characteristic Species

Tree Layer	**Picea glauca** (d)	White spruce
Shrub Layer	**Picea glauca**	White spruce
	Rosa acicularis (d)	Prickly rose
	Viburnum edule	Low-bush cranberry
	Lonicera involucrata	Bracted honeysuckle
	Populus tremuloides	Trembling aspen
	Ribes triste	Wild red currant
	Amelanchier alnifolia	Saskatoon
Forb Layer	**Linnaea borealis**	Twinflower
	Rubus pubescens	Dewberry
	Cornus canadensis	Bunchberry
	Lathyrus ochroleucus	Peavine
	Mertensia paniculata	Tall mertensia
	Aralia nudicaulis	Sarsaparilla
	Actaea rubra	Baneberry
	Maianthemum canadense	Two-leaved Solomon's seal
	Mitella nuda	Bishop's cap

	Equisetum sylvaticum	Woodland horsetail
	Galium boreale	Northern bedstraw
Grass and Graminoid Layer	No constant species	
Mosses and Lichens on Humus	**Hylocomium splendens** (d)	Stair-step moss
	Pleurozium schreberi (d)	Schreber's moss
	Ptilium crista-castrensis	Knight's plume moss
Mosses and Lichens on Trees and Shrubs	**Parmelia sulcata**	
	Usnea alpina	Old man's beard

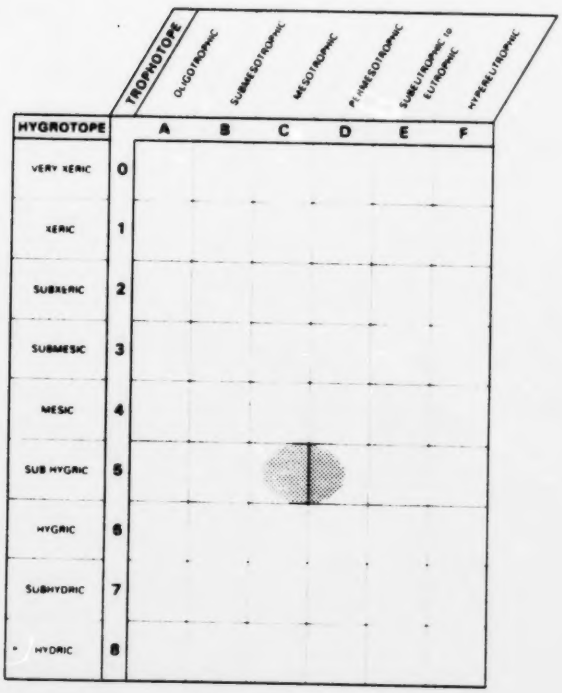

Fig. 3.7. Edatopic Grid: White spruce/Low-bush cranberry-Rose/Feathermoss Association

Stand Characteristics

Mean canopy height	:	23 m (sample min., max. = 21, 28)
Mean stem diameter @ 1.3 m	:	23.1 cm (sample min., max. = 17.7, 31.4)
Mean stand age	:	103 yr. (sample min., max. = 80, 135)
Mean stem density (total live stems/ha)	:	910 (sample min., max. = 525, 1150)
Mean canopy cover	:	50% (sample min., max. = 40. 65)

Young stands of white spruce with a well developed canopy constitute the tree layer of the White spruce/Low-bush cranberry-Rose/Feathermoss association. Rose is dominant in a diverse but sparse shrub layer. The poorly developed forb layer contains a number of constant species, none of which occur consistently with high enough cover to be termed dominant. Twinflower, dewberry and bunchberry may be locally dominant at some sites. Two-leaved Solomon's seal, tall mertensia and palmate-leaved coltsfoot appear to associate more with sites on moraine than sites on glaciolacustrine materials. Insufficient data was collected to speculate reasonably upon the significance of this relationship.

The grass and graminoid layer is almost non-existent, and there are no constant species. A well developed and often nearly continuous moss layer composed primarily of feathermosses is a distinctive feature of this association. Various arboreal lichen species colonize the boles and branches of white spruce.

3.2.3 Discussion: Coniferous Forest Association

White spruce dominated associations of the Kimiwan-Winagami study area usually occur on moist to very moist, mesotrophic to permesotrophic, and imperfectly to poorly drained fine-textured

glaciolacustrine and morainal materials. Soils generally belong to the Gray Luvisol and Luvic Gleysol soil great groups, and have slightly acidic pH's in the rooting zone. Stands belonging to both the White spruce/Low-bush cranberry-Rose and White spruce-Aspen/Low-bush cranberry-Rose association are overmature seral or young climax communities, indicating that major stand disturbances such as fire have occurred less frequently on sites supporting conifer-dominated communities than on those supporting hardwood-dominated stands.

Understory development in white spruce dominated stands appears to be strongly influenced by canopy closure. In general, understory vascular plant growth is best under white spruce-aspen canopies which allow a large proportion of sunlight to reach the forest floor.

3.3 Wetland Associations

Wetlands are areally extensive throughout the Kimiwan-Winagami study area on level and depressional terrain. Three wetland associations are described below, based on analyses of vegetation and environment data from five sites.

3.3.1 Black spruce/Labrador tea/Sphagnum moss Association (**Picea mariana/Ledum groenlandicum/Sphagnum spp.**)

Site and Soil Characteristics

Number of sample sites	:	3
Moisture regime	:	Subhydric
Nutrient regime	:	Submesotrophic to mesotrophic
Slope position	:	Plain
Mean slope	:	0.7% (sample min., max. = 0, 1)
Aspect	:	
Mean elevation (masl)	:	622 (sample min., max. = 612, 638)
Parent material	:	Level organic deposits

Soil texture	:	Fibric
Drainage	:	Very poor
Mean soil reaction (upper 160 cm)	:	pH 4.8 (sample min., max. = 4.4, 5.3)
Soil classification	:	Typic Fibrisol

The Black spruce/Labrador tea/Sphagnum moss association is the most extensive of the wetland associations in the study area. Sites are always very poorly drained with water near or at the soil surface. Soils are acidic Typic Fibrisols, and are judged to be submesotrophic to mesotrophic. Figure 3.8 shows the range of soil moisture and nutrient conditions within which communities belonging to this association were observed to occur.

Vegetation

Characteristic Species

Tree Layer	**Picea mariana**	Black spruce
Shrub Layer	**Picea mariana**	Black spruce
	Ledum groenlandicum (d)	Labrador tea
Forb Layer	**Rubus chamaemorus**	Cloudberry
	Vaccinium vitis-idaea	Bog cranberry
	Oxycoccus microcarpus	Small bog cranberry
Grass and Graminoid Layer	**Carex** spp.	Sedges
Mosses and Lichens on Humus	**Sphagnum** spp. (d)	Sphagnum mosses
	Cladina mitis	Reindeer lichen
	Pleurozium schreberi (d)	Schreber's moss
	Hylocomium splendens	Stair-step moss
Mosses and Lichens on Trees and Shrubs	**Usnea alpina**	Old man's beard

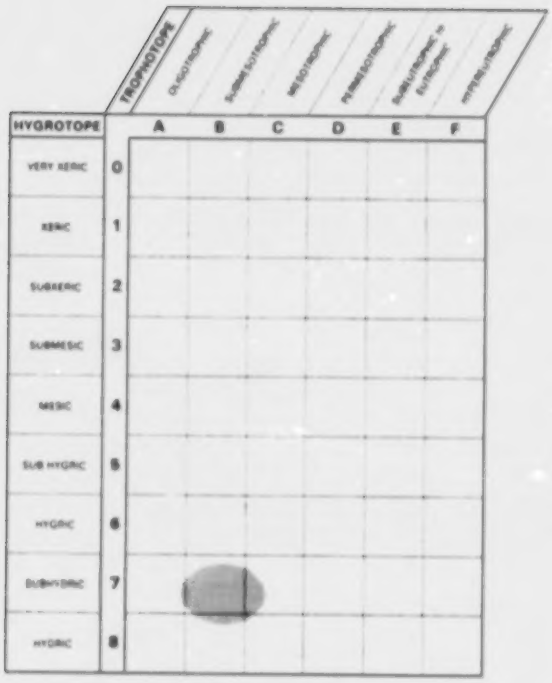

Fig. 3.8. Edatopic Grid: Black spruce/Labrador tea/Sphagnum moss Association

Stand Characteristics

Mean canopy height : 7.3 m (sample min., max = 5, 10)
Mean stem diameter @ 1.3 m: 9.8 cm (sample min., max. = 9.0, 10.5)
Mean stand age : 75 (sample min., max. = 46, 129)
Mean stem density (total live stems/ha) : 450 (sample min., max. = 25, 675)
Mean canopy cover : 6% (sample min., max. = 1, 11)

Lightly stocked and very open stands of stunted black spruce, a well developed but species-poor shrub layer dominated by Labrador tea, sparse forb and grass cover, and a well developed moss and lichen layer dominated by sphagnum and feathermosses characterize this association. Reindeer lichen (**Cladina** spp.) occasionally form a nearly continuous carpet over sphagnum and feathermosses. Stands belonging to this association are burned occasionally, as indicated by variable stand ages and evidence of burning (charred stumps, charcoal in organic layers, recently fire-killed trees).

3.3.2 Willow Shrubland Association (**Salix spp./Carex spp.-Calamagrostis canadensis**)

Number of sample sites	:	1
Moisture regime	:	Hygric
Nutrient regime	:	Permesotrophic
Slope position	:	Lake margins, stream valleys
Slope	:	0
Aspect		
Mean elevation (masl)	:	612
Parent material	:	Glaciolacustrine
Soil texture	:	Moderately fine
Drainage	:	Poor
Soil reaction (upper 160 cm)	:	pH 8.0
Soil classification	:	Orthic Humic Gleysol

The Willow shrubland association is much less common than the Black spruce/Labrador tea/Sphagnum association, and occurs primarily along the east and north shores of Winagami Lake and along Bearhead Creek. Poorly drained, nutrient-rich and fine-textured gleysolic soils are characteristically associated with similar plant community types elsewhere in the Boreal Mixedwood ecoregion (Brierley et al. 1985; Kocaoglu and Bennett 1983, Bishoff (revised 1984)). Figure 3.9 shows

the range of soil moisture and nutrient conditions within which communities belonging to this association might be expected to occur.

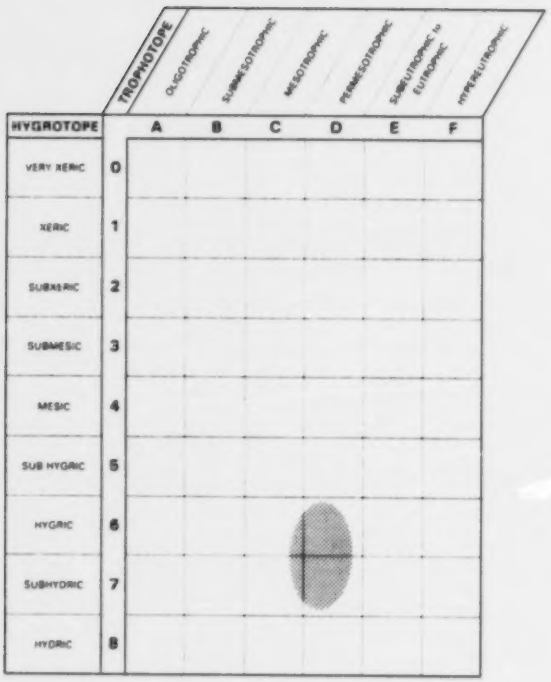

Fig. 3.9. Edatopic Grid: Willow shrubland Association

Vegetation

Important Species[4]

Shrub Layer	**Salix bebbiana** (d) **S. petiolaris,** **S. planifolia**	Bebb willow Willow
Forb Layer	**Trifolium hybridum** **Vicia americana**	Alsike clover Vetch
Grass and Graminoid Layer	**Carex atherodes** (d) **Calamagrostis canadensis** **Juncus spp.**	Awned sedge Marsh reed grass Rushes
Mosses and Lichens on Humus	**Aulacomium palustre** **Brachythecium salebrosum**	Tufted moss

The willow canopy of communities belonging to this association is generally three metres in height or taller and is primarily composed of Bebb willow. Dense willow clumps are interspersed with relatively open areas. Forb and graminoid cover is very low under the dense clumps, but in openings, sedges and marsh reed grass occur with high cover. The presence of alsike clover (**Trifolium hybridum**) might be related to cattle grazing within the sampled stand and pasture improvements adjacent to it. Cattle grazing has likely influenced the species composition of many willow stands in the study area to some degree as both the Winagami Lake and Bearhead Creek areas support cattle grazing. A belt of dead willow along the north shore of Kimiwan

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[4] Because of the sample size (n=1) further sampling is necessary to define what species would be characteristic of the Willow shrubland association in this area of the province. The species listed above appeared to be important components of this association and are somewhat comparable to those of similarly named types cited in other studies of northern Alberta vegetation (Brierley et al. 1985; Kocaoglu and Bennett 1983; Bishoff (revised 1984)).

Lake provides some evidence that changing lake levels have had an effect on the soil water regime along the shoreline.

3.3.3 Tamarack/Sedge Association (*Larix laricina/Carex spp.*)

Number of sample sites	:	1
Moisture regime	:	Hydric
Nutrient regime	:	Permesotrophic
Slope position	:	Lower slopes
Slope	:	0
Aspect	:	
Elevation	:	615 m
Parent material	:	Organic veneer over glaciolacustrine
Soil texture	:	Fine
Drainage	:	Very poor
Soil reaction (upper 160 cm):	:	6.3 (organic), 8.0 (mineral)
Soil classification	:	Terric Fibrisol

The Tamarack/Sedge association appears to be restricted to the perimeters of large Black spruce/Labrador tea/Sphagnum-dominated fens, where runoff and groundwater flow from adjacent uplands contribute to the nutrient supply. Poorly drained, hydric (standing water) organic soils which are judged to be well supplied with nutrients are characteristically associated with similar plant community types elsewhere in the Boreal Mixedwood ecoregion (Kocaoglu and Bennett 1983; Bishoff (revised 1984), Archibald et al. 1985). Figure 3.10 shows the range of soil moisture and nutrient conditions within which communities belonging to this association might be expected to occur.

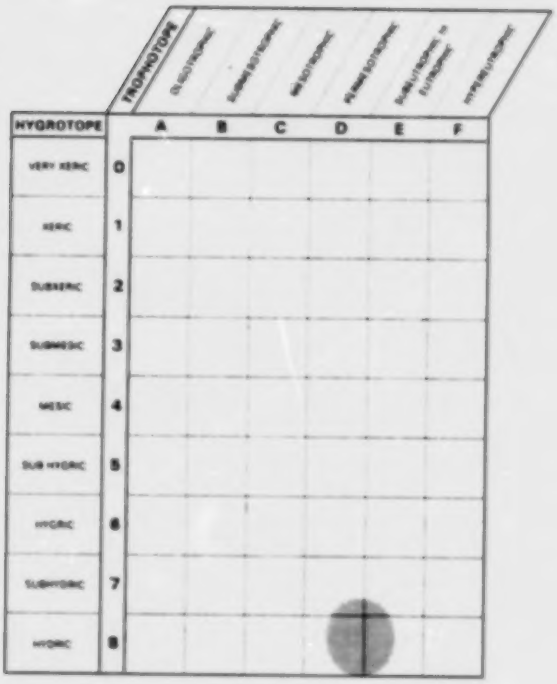

Fig. 3.10. Edatopic Grid: Tamarack/Sedge Association

Vegetation

Important Species[5]

Tree Layer	**Larix laricina** (d)	Tamarack
	Betula papyrifera	Paper birch
Shrub Layer	**Ledum groenlandicum**	Labrador tea
	Salix myrtillifolia	Myrtle-leaf willow
	Larix laricina	Tamarack
Forb Layer	**Caltha palustrus** (d)	Marsh marigold
	Potentilla palustris	Marsh cinquefoil
Grass and Graminoid Layer	**Carex aquatilis** (d)	Water sedge
Mosses and Lichens on Humus	**Drepanocladus aduncus** (d)	Brown moss
Mosses and Lichens on Trees and Shrubs	**Parmelia sulcata**	Arboreal lichen
	Usnea soriidifera	Old man's beard

Stand Characteristics

Canopy height	:	9 m
Stem diameter @ 1.3 m	:	9.6 cm
Stand age	:	48
Stem density (total live stems/ha)	:	975
Canopy cover	:	50%

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[5] Because of the sample size (n=1) further sampling is necessary to define what species would be characteristic of the Tamarack/Sedge association in this area of the province. The species listed above appear to be important components of this association and are somewhat comparable to those of similarly named types cited in other studies (Kocaoglu and Bennett 1983; Resource Evaluation Branch 1985).

Young stands of tamarack with a well developed canopy, a sparse but species rich shrub and forb understory, a well developed grass and graminoid layer dominated by water sedge and a wet moss layer consisting primarily of brown moss (**Drepanocladus aduncus**) are likely characteristic of this association. Accessible stands have been partially cut, and fire has influenced stand development as evidenced by charred stumps in the sample plot.

3.3.4 Discussion: Wetland Associations

The Black spruce/Labrador tea/Sphagnum association is the most nutrient poor of the three wetland associations described above, and is also the most extensive. Both the Willow shrubland and Tamarack/Sedge shrubland associations are generally restricted to river valleys or lakeshore margins and the margins of large fens, respectively, with the latter occurring on the wettest sites.

4. PLANT SUCCESSION

This section presents a successional framework for the Kimiwan-Winagami study area within which the relationships of different plant associations through time can be expressed. Because these relationships have been derived entirely through indirect means (i.e. inferences made from various data collected for the associations), and because a limited data base was available, it should be stressed that this framework is tentative.

Ideally, successional patterns should be studied throughout the developmental stages of various communities following disturbance. From a practical standpoint, however, resource management decisions often cannot wait for the collection and analysis of data over many years, and successional schemes such as those proposed below might be more useful over the short term. In the following discussion, a brief overview of successional theory is followed by a largely diagrammatic presentation of successional schemes for dryland and wetland communities. The subdivision into dryland and wetland areas was made because the factors affecting succession in wetland areas are somewhat different from those of dryland areas.

4.1 Background

The process of plant community development, which involves changes in species structure and community processes with time, and

which results from modification of the physical environment by the community, is termed succession (Daubenmire, 1968; Mueller-Dombois and Ellenberg, 1974; Odum, 1971). These authors distinguish two main types of succession, primary and secondary.

Primary succession occurs on areas which have not been previously occupied by plants, such as bare rock substrates and recently deglaciated areas. Secondary succession occurs on areas which have previously been vegetated and on which soils have developed through plant and microbial action. In the Kimiwan-Winagami area, plant community development along primary successional pathways might occur along stream channels where flooding and ice abrasion or gravel mining expose areas of mineral soil. Overall, however, secondary successional processes are unquestionably the more important determinants of both dryland and wetland community development in the study area.

Succession may be viewed as a function of climate, organisms, relief and parent material all acting through time (Jenny 1961; Major 1951). Both climatic (fire) and edaphic factors are important agents affecting community development in the Kimiwan-Winagami area through their influence on site conditions. The pre-existing vegetation of a disturbed site and the vegetation adjacent to disturbed areas also determine the kind and rate of succession.

4.2 Dryland Succession

Fire, cultivation, and to a minor degree flooding and ice abrasion along stream channels are the main agents responsible for

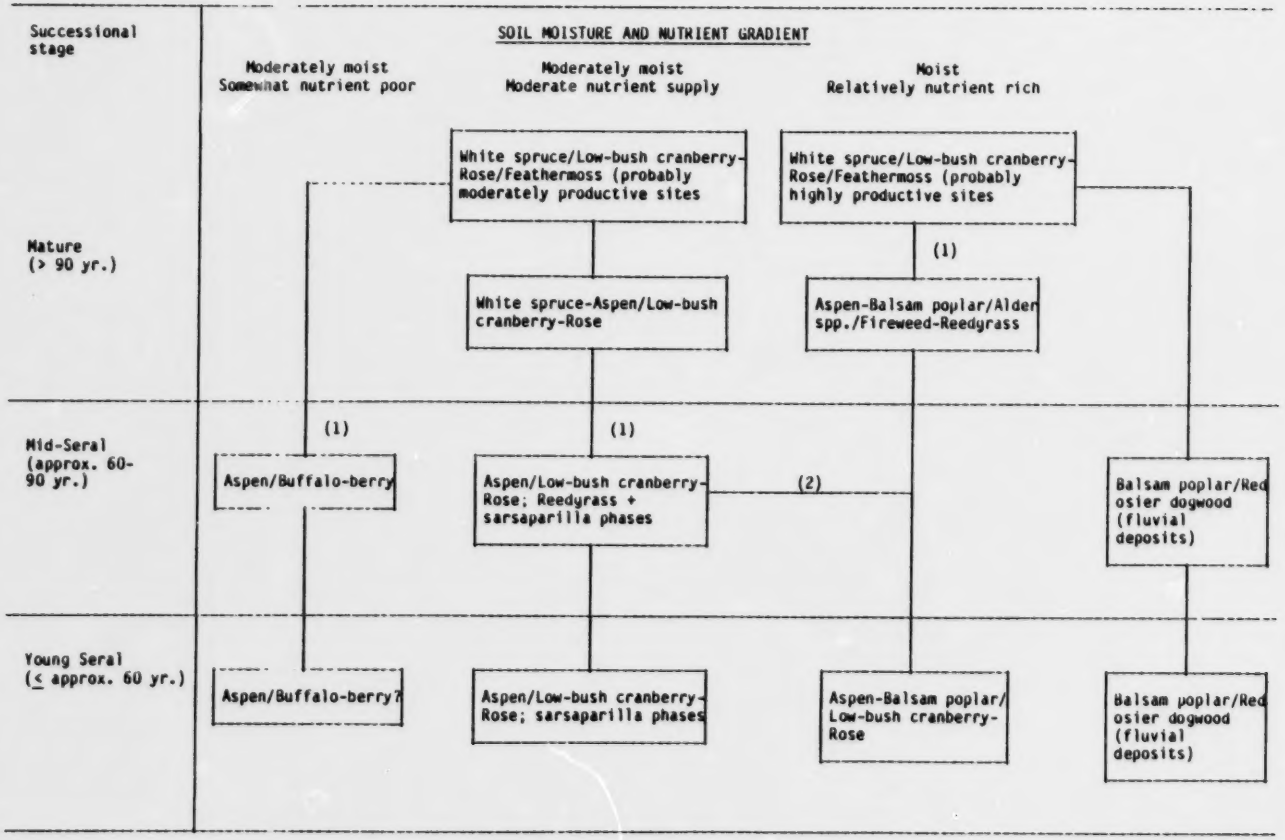

Fig. 4.1 HYPOTHETICAL DRYLAND SUCCESSION: KIMIWAN-WINAGAMI STUDY AREA

(1) Progress towards a white spruce climax appears to be very slow in the Kimiwan-Winagami study area, probably because a seed source is often lacking. Where spruce regeneration is absent or sparse, repeated burning or natural thinning will probably maintain deciduous forests. Natural thinning will produce uneven-aged stands through deciduous regeneration in openings created by mortality in the overstory.

(2) On moister sites, where balsam poplar is a significant component of an aspen-dominated tree canopy, the proportions of aspen to balsam poplar may decline as aspen has a slightly shorter lifespan than balsam poplar. Codominant aspen-balsam poplar stands would probably develop over time.

initiating succession on uplands in the Keg River area. To date, petroleum exploration and development, gravel mining, road construction and other disturbances are relatively unimportant. As mentioned in the background discussion, both primary and secondary successions may occur. Figure 4.1 and the accompanying legend presents a hypothetical framework for dryland secondary succession.

4.3 Wetland Succession

In contrast to dryland successional patterns where the factors affecting vegetation operate cyclically over relatively short time periods (100-250 years), wetland succession appears to be a slower process dependent upon organic matter deposition. The amount of organic matter accumulation has been correlated with the successional stage of wetland development. In general terms, relatively nutrient-rich and floristically diverse fens precede bogs, which are both nutritionally and floristically impoverished (Gorham, 1957 in Daubenmire, 1968, p. 149). Moss (1953b) and Kocaoglu and Bennett (1983) view boreal wetland succession in a similar way, and regard black spruce/labrador tea/moss bog or poor fen as an edaphic climax, with willow and sedge fens as earlier stages. This sequence appears to be valid for the Kimiwan-Winagami study area, and is adopted from the Keg River wetland succession framework in Figure 4.2.

Moss (1953) suggests that the rate of wetland community succession may be affected by periodic water fluctuation. It is also possible that nutrient inputs from surrounding agricultural lands, changes in water quality following fires in upland areas, changes

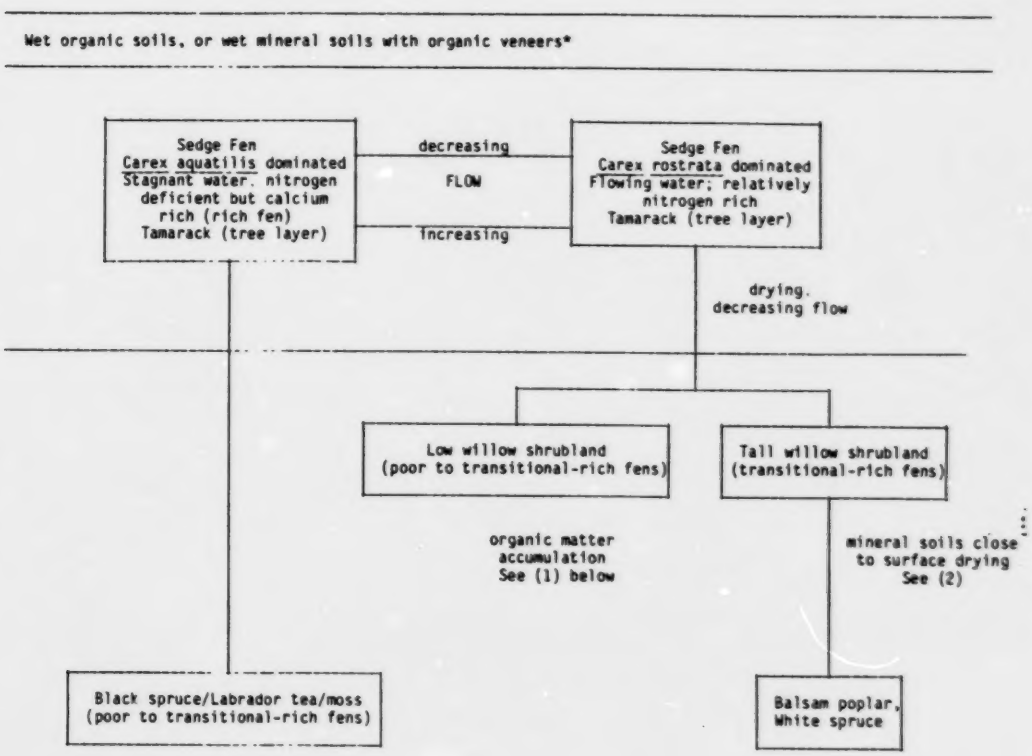

Fig. 4.2 HYPOTHETICAL WETLAND SUCCESSION: KIMIWAN-WINAGAMI STUDY AREA

NOTE:

(1) Low willow shrublands commonly have black spruce in the low shrub layer, which may indicate affinity to the Black spruce/Labrador tea/moss stage. With sufficient time, both low and tall willow shrublands may develop to the Black spruce stage. Dotted lines indicate uncertainty as to time required and complexity of successional pathway.

(2) Balsam poplar is associated with some tall willow shrublands, suggesting that over time balsam poplar may attain dominance. Spruce communities may subsequently develop.

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* D.H. Vitt, University of Alberta, Dept. of Botany, is gratefully acknowledged for input to this framework.

induced by burning of the wetland areas, and edaphic factors (proximity of mineral soil to fen surface, stagnation zones produced by topography [Glaser, 1983]) might have an effect on wetland development.

5. PLANT ASSOCIATIONS AND SITE PRODUCTIVITY

5.1 Introduction

Plant associations represent a synthesis of information about vegetation and associated environmental conditions. To the resource manager, this information can be of value in assessing land use suitability, particularly if a common basis for comparing lands supporting different plant communities can be used. Various quantitative measures of site productivity (the ability of a site to produce trees, forage, etc.) have long been employed by foresters and biologists to facilitate such comparisons.

In the Kimiwan-Winagami study, tree productivity data were collected at a number of sites throughout the area. These data were subsequently grouped by plant association, on the assumption that differences in the physical environment reflected by each association (especially moisture and nutrient status) would be similarly indicated by differences in productivity. To test this assumption, simple statistical comparisons of the data were made, with plant associations as the independent variables. Data collection and analysis methods are dicussed under Methods (Section 2 of this volume, Section 3 of Volume I).

5.2 Data Used in Comparisons

Forestry data, specifically site index (height in m @ 50 yr. reference age), for dominant and codominant tree species appropriate to each association, are employed in analysis. For productivity comparisons, forested associations were ranked on a three part scale according to subdivisions established for Phase III classes by the Alberta Forest Service (Table 5.1)[6]

Table 5.1

PHASE 3 SITE INDEX CLASSES

Species	Phase 3 Site Class	Range of Site Index
Pine	Good (G)	>16.0
	Medium (M)	>12.0 and ≤16.0
	Fair (F)	≤12.0
White Spruce	(G)	>14.5
	(M)	>10.5 and ≤14.5
	(F)	≤10.5
Black Spruce	(G)	>9
	(M)	>6 and ≤9
	(F)	≤6
Aspen	(G)	>17.0
	(M)	>14.0 and ≤17.0
	(F)	≤14.0

For: Engelmann spruce use white spruce.
Balsam fir use white spruce.
Larch use black spruce.
Balsam poplar use aspen.

The site index values shown are for a reference age of 50 years measured at breast height.

Source: V. LeMay, Forest Measurement Section, Alberta Forest Service memorandum (file reference T/M F2.31 Feb. 22, 1985)

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[6] Complete mensuration data are provided for each association and for individual plots in Appendix 1 (mensuration tables).

Forage data collection and analysis was not requested by the client for this study.

5.3 Results of Analysis

Statistical analysis and comparisons of forestry productivity are reported in tabular form in this section. As explained in Section 2 of this volume, sample selection was not random and statistical analyses as conventionally interpreted are therefore not valid. However, the objective of these analyses is to identify trends in the data which facilitate the ordination of plant associations by productivity on a relative scale. Mean, standard deviations and 70 percent confidence intervals are given to provide the user with an indication of data validity, as are the maximum and minimum values of samples comprising the associations. Because the trends reported are relative, numerical data should not be interpreted too strictly.

Productivity comparisons for forestry data are also presented in tabular form in this section. As discussed above, forestry data are presented according to classes defined in Table 5.1.

Table 5.2

DATA SUMMARY: SITE INDEX (ASPEN) M @ 50 YR. FOR STANDS WITH ASPEN COMPONENT (n=37)

Plant Association		$\bar{X}$	Sx	S.E.	Minimum Sample Value	Maximum Sample Value	Range (70% Confidence Interval)	Phase III Site Class	Productivity Class, this Study
Aspen-Balsam poplar/ Alder spp./Reedgrass	n=2	20.6	1.59	1.12	19.5	21.7	18.4-22.8	G	High
Aspen-Balsam poplar/ Low-bush cranberry-Rose	n=6	20.5	1.60	0.65	18.0	22.8	19.7-21.3	G	
Aspen/Low-bush cranberry-Rose, Sarsaparilla phase	n=10	20.0	2.24	0.70	17.5	23.7	19.2-20.8	G	
Aspen/Low-bush cranberry-Rose, Reedgrass phase	n=11	18.6	3.26	0.98	14.1	24.2	17.5-19.7	G	
White spruce/ Feathermoss	n=1	16.9	----	----	16.9	16.9	---------	M	Moderate
White spruce-Aspen/ Low-bush cranberry-Rose	n=4	16.9	1.51	0.76	16.0	19.1	15.9-17.8	M	
Aspen/Buffalo-berry	n=3	16.0	1.73	1.00	14.5	17.9	14.6-17.4	M	

$\bar{X}$ = mean
Sx = standard deviation
S.E. = standard error of the mean

Table 5.3

DATA SUMMARY: SITE INDEX (BALSAM POPLAR), M @ 50 YR. FOR STANDS WITH BALSAM POPLAR COMPONENT (n=12)

Plant Association		$\bar{X}$	SX	S.E.	Minimum Sample Value	Maximum Sample Value	Range (70% Confidence Interval)	Phase III Site Class	Productivity Class, this Study
Aspen/Low-bush cranberry-Rose, Reedgrass phase	n=1	21.2	----	----	21.2	21.2	---------	G	
Aspen/Low-bush cranberry-Rose, Sarsaparilla phase	n=1	21.0	----	----	21.0	21.0	---------	G	High
Aspen-Balsam poplar/ Alder spp./Reedgrass	n=3	19.0	1.72	0.99	18.0	21.0	17.6-20.4	G	
Aspen-Balsam poplar/ Low-bush cranberry-Rose	n=6	18.8	1.49	0.61	16.5	20.4	18.1-19.5	G	
White spruce-Aspen/ Low-bush cranberry-Rose	n=1	14.6	----	----	14.6	14.6	---------	M	Moderate

$\bar{X}$ = mean
Sx = standard deviation
S.E. = standard error of the mean

Table 5.4

DATA SUMMARY: SITE INDEX (WHITE SPRUCE) M @ 50 YR. FOR STANDS WITH WHITE SPRUCE COMPONENT (n=14)

Plant Association		$\bar{X}$	Sx	S.E.	Minimum Sample Value	Maximum Sample Value	Range (70% Confidence Interval)	Phase III Site Class	Productivity Class, this Study
Aspen/Low-bush cranberry-Rose, Reedgrass phase	n=1	20.3	----	----	20.3	20.3	----------	G	High
Aspen/Balsam poplar/ Alder spp./Reedgrass	n=1	17.7	----	----	17.7	17.7	----------	G	
White spruce-Aspen/ Low-bush cranberry-Rose	n=6	16.7	2.26	0.92	12.8	19.1	15.6-17.8	G	
White spruce/Feather-moss	n=6	16.3	3.17	1.29	11.7	21.6	14.8-17.8	G	

Table 5.5

DATA SUMMARY: SITE INDEX (BLACK SPRUCE, TAMARACK) M @ 50 YR. FOR STANDS WITH BLACK SPRUCE AND/OR TAMARACK COMPONENT (n=3)

Plant Association		$\bar{X}$	Sx	S.E.	Minimum Sample Value	Maximum Sample Value	Range (70% Confidence Interval)	Phase III Site Class	Productivity Class, this Study
Tamarack/Sedge (S.I. for tamarack)	(n=1)	14.1	----	----	14.1	14.1	----------	G	High
Black spruce/Labrador tea/Sphagnum	(n=2)	6.7	3.1	2.19	4.5	8.9	2.4-11.0	M	Moderate

$\bar{X}$ = mean
Sx = standard deviation
S.E. = standard error of the mean

APPENDIX 1

1. INVENTORY DATA ANALYSES: LEGENDS FOR TABLES

This part of Appendix 1 explains column and row headings for tables which follow in Section 2. These tables present site data (ENVIRONMENT/SOILS-VEGETATION TABLES), vegetation data (VEGETATION TABLES) and mensuration data (MENSURATION SUMMARY) for plots belonging to plant associations described in Section 3 of Volume II.

These data are currently stored on the University of Alberta MTS (Michigan Terminal System) computer system, and were manipulated using existing programs that sort data into groups defined by the researcher.

1.1 Environment/Soils-Vegetation Tables

These tables present site data for individual sites comprising an association. Average values are calculated for several parameters and are reported in the MEAN column of each table. Table headings indicate the association to which the table applies. For example, MW A1 POPULUS TREMULOIDES/SHEPHERDIA CANADENSIS indicates that the table corresponds to the Aspen/Buffalo-berry association (A1) of the Mixedwood (MW) ecoregion. The abbreviation A1 is used to facilitate data presentation in the extended legend of Volume I.

Individual site data are recorded in vertical columns. Upland sites are grouped first by parent material and then by soil moisture status. A brief description of row headings follows.

PLOT NUMBER

Assigned to an individual plot. Records are stored on and retrieved from computer data banks using this number.

TOWNSHIP, RANGE, MAP SHEET

Self-explanatory.

ELEVATION (MASL)

Elevation in metres above sea level.

SLOPE, ASPECT

Self-explanatory.

ECOLOGICAL MOISTURE REGIME

The following codes are used in the tables and are fully explained in Section 1, Item 15 of the Integrated Resource Inventory Site Manual (Alberta. Energy and Natural Resources. 1985).

SX	subxeric	(driest)
SM	submesic	
M	mesic	
SHG	subhygric	
HG	hygric	
SHD	subhydric	
HD	hydric	(wettest)

NUTRIENT REGIME

The following codes used in the tables are fully explained in Section 1, Item 19 of the Integrated Resource Inventory Site Manual (Alberta, Energy and Natural Resources. 1985).

O	oligotrophic	(most nutrient-poor)
SM	submesotrophic	
M	mesotrophic	
PM	permesotrophic	(most nutrient-rich)

OVERLYING MATERIAL/UNDERLYING MATERIAL

Generally equivalent to parent material, except on organic terrain. Abbreviations follow the Canadian System of Soil Classification (1978) and are detailed in Section 1, Item 23 of the Integrated Resource Inventory Site Manual (Alberta Energy and Natural Resources, 1985). The major ones are as follows:

OVERLYING MATERIAL/UNDERLYING MATERIAL

Generally equivalent to parent material, except on organic terrain. Abbreviations follow the Canadian System of Soil Classification (1978) and are detailed in Section 1, Item 23 of the Integrated Resource Inventory Site Manual (Alberta Energy and Natural Resources, 1985). The major ones are as follows:

Landform		Modifier	
C	colluvium	v	veneer
F	fluvial	b	blanket
GF	glaciofluvial	i	inclined
GL	glaciolacustrine	l	level
L	lacustrine	h	hummocky
LT	lacustrotill	t	terrace
M	moraine	r	ridged
O	organic	m	rolling
X	residual	s	sloping (applied to organic materials)

SOIL SUBGROUP/SOIL GREAT GROUP

Abbreviations follow the Canadian System of Soil Classification (1978).

SOIL DRAINAGE

Abbreviations are detailed in Section 1, Item 17 of the Integrated Resource Inventory Site Manual (Alberta Energy and Natural Resources, 1985). These are summarized as follows:

VP - very poor	MW - moderately well
P - poor	W - well
I - imperfect	R - rapid

SOLUM THICKNESS

Top of A horizon to bottom of B horizon.

TYPE AND DEPTH TO RESTRICT (ION)

W - water
L - lithic
K - carbonate
P - frozen

The number indicates depth to restriction in centimetres

THICKNESS LFH:

Self-explanatory

pH LFH/A/B/C

Soil reaction of the litter layer and the A, B and C horizons.

TEXTURE A1/B2/C3

Abbreviations follow the Canadian System of Soil Classification (1978) and are outlined in Section 2, Item 6 of the Integrated Resource Inventory Site Manual (Alberta. Energy and Natural Resources, 1985). These are summarized as follows:

S - sand	HC - heavy clay
Si - silt	L - loam
C - clay	

COARSE FRAGMENTS - B(%)

Self explanatory

SEEPAGE (*) & MOTTLING

Presence of seepage indicated by (*) and depth to mottling given in centimetres.

ROOTING DEPTH

Depth at which abundance of roots declines to very few.

ASSOCIATION

The code assigned to each association to facilitate data presentation within the report.

STAND AGE

Age of oldest tree(s) measured in plot, except where these are obviously scattered remnants of pre-existing stands. Not necessarily equivalent to stand age reported in mensuration tables, which is an average of all ages taken in plots.

CANOPY HEIGHT

Average height of trees forming the main canopy.

MEAN ANNUAL INCREMENT

Reported as gross volume, in m^3/ha/yr, as calculated by a mensuration program (Section 1.3 of this Appendix).

STRATA COVERAGE (%) A/B/C/G/D/L

Visually estimated coverages for the tree (A), shrub (B), forb (C), grass and graminoid (G), bryophyte (D) and lichen (L) layers.

SURFACE SUBST(RATE) - DEAD WOOD, ETC.

Per cent of surface covered by various materials; visually estimated.

BIOMASS (KG/HA) FORBS/GRAMINOIDS/BROWSE

Self-explanatory

1.2 Vegetation Tables

There are two levels of vegetation information presented in the vegetation tables: (a) summaries of individual plots within each plant association; and (b) summaries of plant associations.

(a) Individual Plot Summary Tables

These tables present plot data for each plant association in exactly the same order of plots as for the Environment/Soils-Vegetation tables discussed above. This is done to facilitate comparisons between vegetation information and environmental conditions. Again, individual site data are recorded in vertical columns.

The heading of each table gives the name of the association (preceded by its code as discussed in Section 1.1), as well as a list of the abbreviations for term used within the tables (e.g. PRESENCE [%P]). Table headings are defined as follows:

ECOSYM UNIT

The abbreviation assigned to each associations is printed here (e.g. MW A1 for the **Populus tremuloides/Shepherdia canadensis** association). These are discussed in Section 1.1 above.

PLOT NUMBER

See PLOT NUMBER description in Section 1.1 above.

NUMBER OF SPECIES PER PLOT

Total number of species (vascular and non-vascular) are recorded here and an average is calculated.

SPECIES

A seven letter code is assigned to each plant species. Full Latin and common names for each code are given in Appendix 2 of this volume.

A1/A2/E/B1/B2/C/G/D/L LAYER

A1 - main tree canopy
A2 - understory trees over 5 m tall
E - epiphytes (lichens, bryophytes on trees, shrubs)
B1 - Tall shrubs and tree regeneration 2.5-5m tall
B2 - low shrubs and tree regeneration less than 2.5 m tall
C - forbs
G - grasses and grass-like species (e.g. cottongrass, sedge rushes)
D - bryophytes on dominant substrate (usually on soil)
L - lichens on dominant substrate (usually on soil)

PRESENCE (%P)

This measure is defined as the percentage of occurrence of a species in plots which belong to a given plant association, and can range from greater than 0% to 100%. SPECIES are listed in order of highest to lowest presence within each layer.

MEAN COVER (MC)

The average visually estimated foliar cover of a given plant species; percent cover for the species is totalled for all plots and divided by the total number of plots.

COVER (%C)

A visual estimate of foliar cover for a given species in an individual plot. A blank means that the species was not present within the plot. Ranges from 1 to 100 per cent.

SOCIABILITY (S)

Not evaluated

VIGOR (V)

Refers to the relative size and health of the plant.

0 = dead
1 = poor
2 = fair (average)
3 = good
4 = excellent

(b) Summary Vegetation Table

These tables constitute a comparison between the plant associations determined by the vegetation tables, and are a summary of the plant species for all associations. The vegetation program takes the mean cover and percent presence for each plant association and lists them alphabetically by SPECIES. The heading PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE refers to percent presence and mean cover, respectively.

PRESENCE CLASSES

As follows:

Percent Presence	Presence Class
Occurrence in 0.1-20% of plots in association	I
Occurrence in 20.1-40% of plots in association	II
Occurrence in 40.1-60% of plots in association	III
Occurrence in 60.1-80% of plots in association	IV
Occurrence in 80.1-100% of plots in association	V

MEAN SPECIES SIGNIFICANCE

Are the same as those presented in the AVERAGE VALUE column for a given association and species.

The associations are denoted by an alphanumeric code (e.g. MW A1 is the **Populus tremuloides/Shepherdia canadensis** association) as described in Section 1.1 above.

1.3 Mensuration Summary

Each plot at which mensuration data was collected is described with reference to plot number, size, species and a number of related

parameters. Abbreviation for species encountered in the Kimiwan-Winagami study are as follows:

AW - Trembling aspen (**Populus tremuloides**)
PB - Balsam poplar (**Populus balsamifera**)
BW - Paper birch (**Betula papyrifera**)
SW - White spruce (**Picea glauca**)
SB - Black spruce (**Picea mariana**)
PL - Lodgepole pine (**Pinus contorta** var. **latifolia**)
LT - Tamarack (**Larix laricina**)

Other Abbreviations

MAI Mean annual increment (= total volume divided by stand age for total MAI, or merchantable volume divided by stand age for merchantable MAI).

S.I. Site index - a measure of site quality as expressed by height in metres at a reference age (50 years).

CONF Coniferous (SW, SB, PL, LT)

HDWD Hardwood (AW, PB, BW)

Summary tables for each association in which mensuration data was collected for individual plots are also given. The association is identified in the table heading by its assigned name and abbreviation (e.g. MW A1 **Populus tremuloides/Shepherdia canadensis**). Two summary tables are produced; the first gives statistical information pertaining to various parameters analysed for all plots together, and the second gives mensuration data for individual plots.

PLOT NUMBERS

Plot numbers are recorded the same as those on the environment and vegetation tables.

ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY

TITLE : A1 POPULUS TREMULOIDES/SHEPHERDIA TABLE 1

	MEAN	5K W017 7717 W 5	5K W033 7819 W 5	5K W056 7719 W 5
PLOT NUMBER				
TOWNSHIP & RANGE				
MERIDIAN				
MAPSHEET		83 N 10	83 N 15	83 N 10
PHYSIOGRAPHIC SUBREGION		BP	FP	FP
GEOMORPHIC SYSTEM				
ECOSECTION		GLM1	GL2	GL2
ELEVATION(MASL)	623.7	638	618	615
SLOPE(%)	2.0	1	4	1
ASPECT(DEG)		20	290	264
ENVIRONMENT/SOILS :				
ECOLOGICAL MOISTURE REGIME		M	M	SHG
NUTRIENT REGIME		SM	M	SM
OVERLYING MATERIAL		GLh	GLu	GLi
UNDERLYING MATERIAL				
EROSION/DEPOSITION				
SOIL SUBGROUP		BR	SZ	O
SOIL GREAT GROUP		GL	GL	LG
SOIL DRAINAGE		MW	MW	P
SOLUM THICKNESS(CM)	49.7	62	49	38
TYPE & DEPTH TO RESTRICT(CM)				
THICKNESS LFH(CM)	5.3	3	5	8
pH-LFH	0.0			
-A	4.5	4.5	4.5	4.5
-B	4.7	4.0	4.5	5.5
-C	7.5	8.0	8.0	6.5
TEXTURE-A/1		CL	SIL	SIL
-B/2		CL	HC	C
-C/3		C	HC	C
COARSE FRAGMENTS-B(%)	0.0	0	0	0
SEEPAGE(•) & MOTTLING(CM)				11
ROOTING DEPTH(CM)	57.0	62	49	60
VEGETATION :				
ASSOCIATION		A1	A1	A1
STAND AGE(YR)	68.7	79	60	67
CANOPY HEIGHT(M)	16.7	19	16	15
MEAN ANNUAL INCREMENT	0.0			
STRATA COVERAGE(%)-A	46.7	55	45	40
-B	60.0	40	65	75
-C	35.0	15	45	45
-G	10.0	10	5	15
-D	0.7	1	1	0
-L	0.0	0	0	0
SURFACE SUBST(%)-DEAD WOOD	2.7	2	3	3
-BEDROCK	0.0	0	0	0
-STONES	0.0	0	0	0
-MIN.SOIL	0.0	0	0	0
-ORGANIC	97.3	98	97	97
-OPEN WATER	0.0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0			
-GRAMINOIDS	0.0			
-BROWSE	0.0			

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TITLE : A2 POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, CALAMAGROSTIS PHASE

RESOURCE INVENTORY TABLE 2

PLOT NUMBER	MEAN	5K W053	5K W030	5K W031	5K W021	5K W026	5K W054	5K W024	5K W007	5K W049	5K W023	5K W050	5K W004
TOWNSHIP & RANGE		77 16	78 19	78 19	77 16	80 19	76 19	80 19	77 17	77 17	77 16	77 17	76 18
MERIDIAN		W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5
MAPSHEET		83 N 9	83 N 15	83 N 15	83 N 9	83 N 15	83 N 10	83 N 15	83 N 10	83 N 10	83 N 9	83 N 10	83 N 10
PHYSIOGRAPHIC SUBREGION		BP	FP	FP	BP	BP	FP	BP	BP	BP	HRU	FP	FP
GEOMORPHIC SYSTEM													
ECOSECTION		GLM1	GL2	GL2	GLM1	M1	GL2	M2	GLM1	GLM1	M1	GL3	GL3
ELEVATION(MASL)	630.7	635	615	615	641	638	617	623	638	626	672	618	630
SLOPE(%)	2.4	5	0	1	3	3	4	2	3	1	3	2	2
ASPECT(DEG)		270		188	360	6	20	333	50	280	260	14	30
ENVIRONMENT/SOILS :													
ECOLOGICAL MOISTURE REGIME		SHG	SHG	SHG	SHG	M	M	SHG	M	M	M	M	M
NUTRIENT REGIME		PM	M	M	PM	M	M	M	PM	SM	M	SM	M
OVERLYING MATERIAL		GL i	GLk	GLuk	GLv	GLv	GLb	Mk	Mu i	Mu	MD	Mm	Fv
UNDERLYING MATERIAL					M1	Mu	Mhu				R1		M
EROSION/DEPOSITION													
SOIL SUBGROUP		0	0	0	0	0	SZ	GLG	0	G	0	G	0
SOIL GREAT GROUP		GL	LG	LG	LG	R	GL	SS	GL	SO	GL	SO	R
SOIL DRAINAGE		W	P	P	P	W	W	I	MW	MW	W	MW	W
SOLUM THICKNESS(CM)	35.8	42	36	41	24	5	59	34	18	56	31	59	24
TYPE & DEPTH TO RESTRICT(CM)			R 36			R 40		R 35					R 24
THICKNESS LFH(CM)	7.7	9	6	10	10	7	5	11	3	10	10	6	5
pH-LFH	0.0												
-A	6.0	7.0	7.0	6.0	4.5	6.5	5.5	5.5	6.5	4.5	7.0	5.0	6.5
-B	5.4	7.0	7.0	5.5	4.5		4.5	5.5	5.5	4.0	7.0	4.0	
-C	7.1	7.0	8.0	6.0	7.0	7.0	8.0	8.0	4.5	8.0	7.0	8.0	7.0
TEXTURE-A/1		CL	SIL	SIL	SIC	S	SIL	SIL	SL	SIL	SL	SIL	S
-B/2		CL	C	HC	HC		SIC	HC	SIC	C	CL	C	
-C/3		SIC	CL	HC	HC	C	SIC	HC	C	HC	SL	C	SIC
COARSE FRAGMENTS-B(%)	1.8	0	0	0	1	0	1	8	2	2	5	2	0
SEEPAGE(*) & MOTTLING(CM)				6									
ROOTING DEPTH(CM)	53.8	70	36	50	60	40	60	35	75	56	80	59	24
VEGETATION :													
ASSOCIATION		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
STAND AGE(YR)	61.8	96	50	54	94	40	41	131	34	53		45	42
CANOPY HEIGHT(M)	18.0	28	15	15	22	15	12	22	12	14	30	15	16
MEAN ANNUAL INCREMENT	0.0												
STRATA COVERAGE(%)-A	45.8	25	70	55	30	45	40	40	40	65	35	70	35
-B	60.4	75	65	50	85	30	40	80	80	50	80	75	15
-C	29.6	40	60	30	25	20	30	25	10	25	35	30	25
-G	11.0	15	10	15	10	20	10	7	15	10	10	5	5
-D	0.2	0	0	0	0	0	0	0	1	1	0	0	0
-L	0.0	0	0	0	0	0	0	0	0	0	0	0	0
SURFACE SUBST(%)-DEAD WOOD	4.9	4	2	3	8	7	3	10	2	2	5	3	10
-BEDROCK	0.0	0	0	0	0	0	0	0	0	0	0	0	0
-STONES	0.0	0	0	0	0	0	0	0	0	0	0	0	0
-MIN.SOIL	0.0	0	0	0	0	0	0	0	0	0	0	0	0
-ORGANIC	94.3	96	98	97	92	83	97	90	98	98	95	97	90
-OPEN WATER	0.0	0	0	0	0	0	0	0	...0	0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0												
-GRAMINOIDS	0.0												
-BROWSE	0.0												

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TITLE : A3 POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, ARALIA PHASE TABLE 3

	MEAN	SK W001	SK W012	SK W005	SK W043	SK W002	SK W003	SK W006	SK W011	SK W038	SK W039
PLOT NUMBER											
TOWNSHIP & RANGE		76 18	76 18	77 17	77 19	76 18	76 18	77 17	77 16	77 19	77 18
MERIDIAN		W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5	W 5
MAPSHEET		83 N 10	83 N 10	83 N 10	83 N 10	83 N 10	83 N 10	83 N 10	83 N 9	83 N 10	83 N 10
PHYSIOGRAPHIC SUBREGION		FP	FP	BP	FP	FP	FP	BP	HRU	FP	FP
GEOMORPHIC SYSTEM											
ECOSECTION		GL 1	GL 1	GLM1	GL2	GL 1	GL3	GLM1	M1	GL2	GL2
ELEVATION(MASL)	630 6	635	612	623	612	635	630	632	701	614	612
SLOPE(%)	3.1	0	2	3	3	4	7	6	2	2	2
ASPECT(DEG)			6	90	34	90	120	200	340	85	360
ENVIRONMENT/SOILS :											
ECOLOGICAL MOISTURE REGIME		SHG	SHG	M	M	M	M	SM	M	M	M
NUTRIENT REGIME		PM	PM	PM	PM	M	M	M	M	M	M
OVERLYING MATERIAL		GLb	GLu	GLuk	GLu	GLb	GLb	GLr	Mu	Mi	Mu
UNDERLYING MATERIAL		Mu					Mu				
EROSION/DEPOSITION											
SOIL SUBGROUP		SZ	O	O	G	O	O	O	DG	SZ	SZ
SOIL GREAT GROUP		GL	GL	GL	SO	GL	GL	GL	SS	GL	GL
SOIL DRAINAGE		W	W	W	MW	W	W	W	I	MW	W
SOLUM THICKNESS(CM)	39.9	52	34	29	56	46	49	25	31	35	42
TYPE & DEPTH TO RESTRICT(CM)		32	W160			R 30		R 25			
THICKNESS LFH(CM)	6.5	5	6	5	5	7	5	10	6	6	10
pH-LFH	0.0										
-A	6.3	5.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.0	6.0
-B	6.3	6.5	7.5	6.5	6.5	6.5	6.0	7.0	5.5	5.0	5.5
-C	6.9	8.0	8.0	8.0	8.0	8.0	5.5	7.0	5.5	5.5	5.5
TEXTURE-A/1		SiL	SiCL	SL	SiL	SL	SL	CL	L	SiC	SiL
-B/2		SiC	SiC	SiCL	C	SiCL	CL	C	SiCL	C	CL
-C/3		SiCL	SiCL	CL	SiC	SiL	SL	SiC	C	C	C
COARSE FRAGMENTS-B(%)	0.7	0	0	0	1	0	0	0	5	1	0
SEEPAGE(+) & MOTTLING(CM)											
ROOTING DEPTH(CM)	47 6	52	70	29	56	30	69	25	25	70	50
VEGETATION :											
ASSOCIATION		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
STAND AGE(YR)	52.9	75	65	39	73	63	37	34	45	44	54
CANOPY HEIGHT(M)	17.6	21	22	17	20	18	17	15	12	14	20
MEAN ANNUAL INCREMENT	0.0										
STRATA COVERAGE(%)-A	60.5	60	60	70	60	50	60	60	70	55	60
-B	46.0	60	35	50	75	35	40	30	35	40	60
-C	28.5	15	30	15	45	40	25	25	25	40	25
-G	3.0	1	10	2	1	5	1	2	2	5	1
-D	0.3	0	0	2	0	0	0	1	0	0	0
-L	0.1	0	0	0	0	0	0	1	0	0	0
SURFACE SUBST(%)-DEAD WOOD	5 1	10	4	5	1	10	8	5	2	3	3
-BEDROCK	0.0	0	0	0	0	0	0	0	0	0	0
-STONES	0.0	0	0	0	0	0	0	0	0	0	0
-MIN.SOIL	0.0	0	0	0	0	0	0	0	0	0	0
-ORGANIC	94.9	90	96	95	99	90	92	95	98	97	97
-OPEN WATER	0.0	0	0	0	0	0	0	0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0										
-GRAMINOIDS	0.0										
-BROWSE	0.0										

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TITLE : A4 POPULUS TREMULOIDES-P. BALSAMIFERA/VIBURNUM EDULE-ROSA

RESOURCE INVENTORY TABLE 4

PLOT NUMBER	MEAN	5K W008	5K W018	5K W051	5K W036	5K W034	5K W047
TOWNSHIP & RANGE		7717	7819	7718	7717	7717	8119
MERIDIAN		W 5	W 5	W 5	W 5	W 5	W 5
MAPSHEET		83	83	83	83	83	83
		N 10	N 10	N 10	N 10	N 10	N 15
PHYSIOGRAPHIC SUBREGION		FP	FP	FP	BP	HRU	BP
GEOMORPHIC SYSTEM							
ECOSECTION		GL3	GL2	GL3	GLO1	M1	M2
ELEVATION(MASL)	631.8	621	627	630	624	648	641
SLOPE(%)	2.3	3	1	4	3	1	2
ASPECT(DEG)		300	24	36	148	180	260
ENVIRONMENT/SOILS :							
ECOLOGICAL MOISTURE REGIME		M	SHG	SHG	SHG	SHG	SHG
NUTRIENT REGIME		M	PM	M	PM	PM	PM
OVERLYING MATERIAL		GLu	GL1v	GLu	GLu1	Mu	M1u
UNDERLYING MATERIAL							
EROSION/DEPOSITION							
SOIL SUBGROUP		O	O	O	O	O	O
SOIL GREAT GROUP		EB	HR	GL	LG	LG	GL
SOIL DRAINAGE		W	W	W	P	P	I
SOLUM THICKNESS(CM)	52.7	16	10	48	160	34	48
TYPE & DEPTH TO RESTRICT(CM)				W120			
THICKNESS LFH(CM)	7.7	12	10	8	4	2	10
pH-LFH	0.0						
-A	7.3		8.0	8.0	7.0	6.5	7.0
-B	7.1	7.0		8.0	7.0	7.0	6.5
-C	7.4	7.0	8.0	8.0	8.0	8.0	5.5
TEXTURE-A/1			SiCL	LS	SiCL	SI	LS
-B/2		LS		SL	SiCL	SiC	SCL
-C/3		SCL	SiC	SL	SiC	C	SCL
COARSE FRAGMENTS-B(%)	2.8	0	0	0	0	1	16
SEEPAGE(*) & MOTTLING(CM)				*120	32		
ROOTING DEPTH(CM)	61.0	36	70	60	100	40	60
VEGETATION :							
ASSOCIATION		APB1	APB1	APB1	APB1	APB1	APB1
STAND AGE(YR)	43.5	37	40	44	49	50	41
CANOPY HEIGHT(M)	14.7	14	13	15	15	16	15
MEAN ANNUAL INCREMENT	0.0						
STRATA COVERAGE(%)-A	53.3	60	50	30	60	60	60
-B	48.3	40	60	60	55	60	15
-C	54.2	55	80	40	25	40	85
-G	4.0	0	5	4	8	2	5
-D	0.3	1	0	0	0	0	1
-L	0.0	0	0	0	0	0	0
SURFACE SUBST(%)-DEAD WOOD	4.0	8	2	5	2	5	2
-BEDROCK	0.0	0	0	0	0	0	0
-STONES	0.0	0	0	0	0	0	0
-MIN.SOIL	0.0	0	0	0	0	0	0
-ORGANIC	96.0	92	98	95	98	95	98
-OPEN WATER	0.0	0	0	0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0						
-GRAMINOIDS	0.0						
-BROWSE	0.0						

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ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY

TITLE : A5 POPULUS TREMULOIDES-P.BALSAMIFERA/ALNUS/EPILOBIUM-CALAMAGROSTI TABLE 5

	MEAN	5K WO16 7717 W 5	5K WO15 7718 W 5	5K WO46 8118 W 5	5K WO10 7716 W 5
PLOT NUMBER					
TOWNSHIP & RANGE					
MERIDIAN					
MAPSHEET		83	83	83	83
		N 10	N 10	N 15	N 9
PHYSIOGRAPHIC SUBREGION		HRU	BP	BP	HRU
GEOMORPHIC SYSTEM					
ECOSECTION		M1	GLM1	M2	M1
ELEVATION(MASL)	665.0	639	642	711	668
SLOPE(%)	4.5	1	0	6	11
ASPECT(DEG)		340		190	24
ENVIRONMENT/SOILS :					
ECOLOGICAL MOISTURE REGIME		M	SHG	SHG	SHG
NUTRIENT REGIME		PM	PM	M	PM
OVERLYING MATERIAL		M1	GLk	Mu	M1
UNDERLYING MATERIAL					
EROSION/DEPOSITION					
SOIL SUBGROUP		SZ	O	BR	GLD
SOIL GREAT GROUP		GL	R	GL	GL
SOIL DRAINAGE		MW	W	W	I
SOLUM THICKNESS(CM)	44.0	30	3	106	37
TYPE & DEPTH TO RESTRICT(CM)		R 30			
THICKNESS LFH(CM)	12.8	12	11	12	16
pH-LFH	0.0				
-A	6.0	6.5	6.5	4.5	6.5
-B	5.2	5.5		4.5	5.5
-C	6.1	5.5	5.5	8.0	5.5
TEXTURE-A/1		SL	SIC	LS	SL
-B/2		C		SCL	CL
-C/3		HC	SIC	SCL	C
COARSE FRAGMENTS-B(%)	8.0	7	0	15	10
SEEPAGE(*) & MOTTLING(CM)					
ROOTING DEPTH(CM)	74.0	50	80	106	60
VEGETATION :					
ASSOCIATION		APB2	APB2	APB2	APB2
STAND AGE(YR)	119.3	92	141	126	118
CANOPY HEIGHT(M)	25.8	25	28	26	24
MEAN ANNUAL INCREMENT	0.0				
STRATA COVERAGE(%)-A	27.5	25	40	20	25
-B	72.5	75	80	60	75
-C	25.0	15	20	30	35
-G	20.8	10	20	50	3
-D	0.3	0	0	1	0
-L	0.0	0	0	0	0
SURFACE SUBST(%)-DEAD WOOD	7.0	10	3	10	5
-BEDROCK	0.0	0	0	0	0
-STONES	0.0	0	0	0	0
-MIN.SOIL	0.0	0	0	0	0
-ORGANIC	93.0	90	97	90	95
-OPEN WATER	0.0	0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0				
-GRAMINOIDS	0.0				
-BROWSE	0.0				

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ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY
TABLE 6

TITLE : Pb POPULUS BALSAMIFERA/CORNUS STOLONIFERA

	MEAN	5K
PLOT NUMBER		W052
TOWNSHIP & RANGE		7618
MERIDIAN		W 5
MAPSHEET		83
PHYSIOGRAPHIC SUBREGION		N 10
GEOMORPHIC SYSTEM		F1
ECOSECTION		
ELEVATION(MASL)	593.0	593
SLOPE(%)	2.0	2
ASPECT(DEG)		340
ENVIRONMENT/SOILS :		
ECOLOGICAL MOISTURE REGIME		SHG
NUTRIENT REGIME		PM
OVERLYING MATERIAL		Ft1
UNDERLYING MATERIAL		
EROSION/DEPOSITION		
SOIL SUBGROUP		0
SOIL GREAT GROUP		HR
SOIL DRAINAGE		W
SOLUM THICKNESS(CM)	32.0	32
TYPE & DEPTH TO RESTRICT(CM)		
THICKNESS LFH(CM)	10.0	10
pH-LFH	0.0	
-A	7.0	7.0
-B	0.0	
-C	6.5	6.5
TEXTURE-A/1		L
-B/2		
-C/3		SL
COARSE FRAGMENTS-B(%)	0.0	0
SEEPAGE(*) & MOTTLING(CM)		
ROOTING DEPTH(CM)	60.0	60
VEGETATION :		
ASSOCIATION		PB
STAND AGE(YR)	86.0	86
CANOPY HEIGHT(M)	23.0	23
MEAN ANNUAL INCREMENT	0.0	
STRATA COVERAGE(%)-A	40.0	40
-B	30.0	30
-C	80.0	80
-G	20.0	20
-D	0.0	0
-E	0.0	0
SURFACE SUBST(%)-DEAD WOOD	3.0	3
-BEDROCK	0.0	0
-STONES	0.0	0
-MIN.SOIL	0.0	0
-ORGANIC	97.0	97
-OPEN WATER	0.0	0
BIOMASS(KG/HA)-FORBS	0.0	
-GRAMINOIDS	0.0	
-BROWSE	0.0	

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ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY

TABLE 7

TITLE : SwA PICEA GLAUCA-P. TREMULOIDES/VIBURNUM EDULE-ROSA

		5K	5K	5K	5K	5K	5K
PLOT NUMBER	MEAN	W028	W029	W009	W055	W022	W027
TOWNSHIP & RANGE		7819	7819	7716	7719	7717	7819
MERIDIAN		W 5	W 5	W 5	W 5	W 5	W 5
MAPSHEET		83	83	83	83	83	83
		N 15	N 15	N 9	N 10	N 9	N 15
PHYSIOGRAPHIC SUBREGION		FP	FP	HRU	FP	HRU	BP
GEOMORPHIC SYSTEM							
ECOSECTION		GL2	GL2	M1	GL2	M1	GLM1
ELEVATION(MASL)	641.0	618	627	681	621	645	654
SLOPE(%)	1.8	1	1	2	2	0	5
ASPECT(DEG)		240	294	320	320		220
ENVIRONMENT/SOILS :							
ECOLOGICAL MOISTURE REGIME		M	M	SHG	M	SHG	SHG
NUTRIENT REGIME		M	PM	PM	M	PM	M
OVERLYING MATERIAL		GLku	GL 1	M1	Muh	M1	Mu
UNDERLYING MATERIAL							
EROSION/DEPOSITION							
SOIL SUBGROUP		SZ	O	O	D	GL	HU
SOIL GREAT GROUP		GL	GL	LG	GL	GL	LG
SOIL DRAINAGE		MW	W	P	I	I	I
SOLUM THICKNESS(CM)	40.7	54	58	27	38	36	31
TYPE & DEPTH TO RESTRICT(CM)				R 27			
THICKNESS LFH(CM)	8.5	6	8	8	10	10	9
pH-LFH	0.0						
-A	5.6	4.5	6.5	4.5	5.5	5.5	7.0
-B	5.8	5.0	6.5	5.5	5.5	5.5	6.5
-C	6.9	8.0	8.0	5.5	5.5	8.0	6.5
TEXTURE-A/1		SiC	SiCL	SCL	SiL	CL	SiL
-B/2		C	C	SiCL	SiC	C	SiC
-C/3		C	SiC	HC	SiC	C	SiC
COARSE FRAGMENTS-B(%)	2.2	0	0	5	1	7	0
SEEPAGE(*) & MOTTLING(CM)							19
ROOTING DEPTH(CM)	52.5	60	50	27	38	60	80
VEGETATION :							
ASSOCIATION		SWA	SWA	SWA	SWA	SWA	SWA
STAND AGE(YR)	123.0	136	118	133	95	116	140
CANOPY HEIGHT(M)	25.0	23	26	28	24	22	27
MEAN ANNUAL INCREMENT	0.0						
STRATA COVERAGE(%)-A	38.3	40	45	35	35	50	25
-B	32.5	15	25	15	30	35	75
-C	38.3	60	50	30	25	25	40
-G	2.0	1	3	3	2	1	2
-D	38.3	45	10	75	90	10	0
-L	0.2	0	0	0	0	1	0
SURFACE SUBST(%)-DEAD WOOD	7.0	7	3	10	5	5	12
-BEDROCK	0.0	0	0	0	0	0	0
-STONES	0.0	0	0	0	0	0	0
-MIN.SOIL	0.0	0	0	0	0	0	0
-ORGANIC	93.0	93	97	90	95	95	88
-OPEN WATER	0.0	0	0	0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0						
-GRAMINOIDS	0.0						
-BROWSE	0.0						

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ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY

TABLE 8

TITLE : Sw PICEA GLAUCA/VIBURNUM-ROSA/HYLOCOMIUM-PLEUROZIUM

	MEAN	5K W019 7819 W 5	5K W032 7819 W 5	5K W035 7717 W 5	5K W013 8018 W 5	5K W045 8120 W 5	5K W048 7920 W 5
PLOT NUMBER							
TOWNSHIP & RANGE							
MERIDIAN							
MAPSHEET		83 N 10	83 N 15	83 N 10	83 N 15	83 N 15	83 N 15
PHYSIOGRAPHIC SUBREGION		FP	FP	BP	BP	BP	BP
GEOMORPHIC SYSTEM							
ECOSECTION		GL 1	GL2	GL01	M2	M2	GLM1
ELEVATION(MASL)	645.2	618	615	645	640	723	630
SLOPE(%)	2.5	0	1	2	2	9	1
ASPECT(DEG)			188	360	246	340	270
ENVIRONMENT/SOILS :							
ECOLOGICAL MOISTURE REGIME		SHG	SHG	SHG	SHG	SHG	SHG
NUTRIENT REGIME		PM	PM	M	M	PM	M
OVERLYING MATERIAL		GLu	GLk	GLb	Mi	Mi	Mu
UNDERLYING MATERIAL				Miu			
EROSION/DEPOSITION							
SOIL SUBGROUP		0	0	0	0	HU	SZ
SOIL GREAT GROUP		LG	LG	LG	LG	LG	GL
SOIL DRAINAGE		P	I	I	P	P	MW
SOLUM THICKNESS(CM)	42.2	60	33	40	40	34	46
TYPE & DEPTH TO RESTRICT(CM)							
THICKNESS LFH(CM)	12.2	26	9	8	10	11	9
pH-LFH	0.0						
-A	5.7	8.0	5.0	5.5	6.5	4.5	4.5
-B	6.0	8.0	5.5	5.5	5.5	5.5	6.0
-C	6.5	8.0	6.5	8.0	4.5	5.5	6.5
TEXTURE-A/1		SiL	SiL	SiC	SiL	L	Si
-B/2		C	C	SiC	SiCL	CL	C
-C/3		SiC	CL	SiC	C	CL	HC
COARSE FRAGMENTS-B(%)	2.2		0	0	5	5	1
SEEPAGE(*) & MOTTLING(CM)		* 40	16	20		* 34	
ROOTING DEPTH(CM)	59.3	40	90	100	40	40	46
VEGETATION :							
ASSOCIATION		SW	SW	SW	SW	SW	SW
STAND AGE(YR)	102.8	127	92	135	80	97	86
CANOPY HEIGHT(M)	23.3	21	23	25	21	28	22
MEAN ANNUAL INCREMENT	0.0						
STRATA COVERAGE(%)-A	52.5	60	50	65	55	40	45
-B	20.5	15	25	30	15	18	20
-C	34.2	10	35	70	20	55	15
-G	4.2	0	1	1	1	20	2
-D	53.3	50	20	70	90	30	60
-L	0.5	0	0	1	1	0	1
SURFACE SUBST(%)-DEAD WOOD	8.2	7	7	5	15	5	10
-BEDROCK	0.0	0	0	0	0	0	0
-STONES	0.0	0	0	0	0	0	0
-MIN.SOIL	0.0	0	0	0	0	0	0
-ORGANIC	91.8	93	93	95	85	95	90
-OPEN WATER	0.0	0	0	0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0						
-GRAMINOIDS	0.0						
-BROWSE	0.0						

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ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY

TITLE : WL SALIX/CAREX-CALAMAGROSTIS

TABLE 9

	MEAN	5K
PLOT NUMBER		W037
TOWNSHIP & RANGE		7719
MERIDIAN		W 5
MAPSHEET		83
		N 10
PHYSIOGRAPHIC SUBREGION		FP
GEOMORPHIC SYSTEM		
ECOSECTION		01
ELEVATION(MASL)	612.0	612
SLOPE(%)	0.0	0
ASPECT(DEG)		
ENVIRONMENT/SOILS :		
ECOLOGICAL MOISTURE REGIME		HG
NUTRIENT REGIME		PM
OVERLYING MATERIAL		GL 1
UNDERLYING MATERIAL		
EROSION/DEPOSITION		
SOIL SUBGROUP		0
SOIL GREAT GROUP		HG
SOIL DRAINAGE		P
SOLUM THICKNESS(CM)	27.0	27
TYPE & DEPTH TO RESTRICT(CM)		W110
THICKNESS LFH(CM)	5.0	5
pH-LFH	0.0	
-A	7.0	7.0
-B	8.0	8.0
-C	8.0	8.0
TEXTURE-A/1		SiC
-B/2		CL
-C/3		SiCL
COARSE FRAGMENTS-B(%)	0.0	0
SEEPAGE(*) & MOTTLING(CM)		27
ROOTING DEPTH(CM)	30.0	30
VEGETATION :		
ASSOCIATION		WS
STAND AGE(YR)	0.0	
CANOPY HEIGHT(M)	5.0	5
MEAN ANNUAL INCREMENT	0.0	
STRATA COVERAGE(%)-A	0.0	0
-B	70.0	70
-C	8.0	8
-G	20.0	20
-D	1.0	1
-L	0.0	0
SURFACE SUBST(%)-DEAD WOOD	1.0	1
-BEDROCK	0.0	0
-STONES	0.0	0
-MIN.SOIL	0.0	0
-ORGANIC	99.0	99
-OPEN WATER	0.0	0
BIOMASS(KG/HA)-FORBS	0.0	
-GRAMINOIDS	0.0	
-BROWSE	0.0	

ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY

TABLE 10

TITLE : Lt LARIX LARICINA/CAREX AQUATILIS

	MEAN	5K
PLOT NUMBER		WO57
TOWNSHIP & RANGE		7819
MERIDIAN		W 5
MAPSHEET		83
		N 10
PHYSIOGRAPHIC SUBREGION		FP
GEOMORPHIC SYSTEM		
ECOSECTION		01
ELEVATION(MASL)	615.0	615
SLOPE(%)	0.0	0
ASPECT(DEG)		
ENVIRONMENT/SOILS :		
ECOLOGICAL MOISTURE REGIME		HD
NUTRIENT REGIME		PM
OVERLYING MATERIAL		Ovb
UNDERLYING MATERIAL		GL1
EROSION/DEPOSITION		
SOIL SUBGROUP		T
SOIL GREAT GROUP		F
SOIL DRAINAGE		VP
SOLUM THICKNESS(CM)	160.0	160
TYPE & DEPTH TO RESTRICT(CM)		
THICKNESS LFH(CM)	68.0	68
pH-LFH	6.3	6.3
-A	0.0	
-B	0.0	
-C	8.0	8.0
TEXTURE-A/1		
-B/2		
-C/3		SiC
COARSE FRAGMENTS-B(%)	0.0	0
SEEPAGE(*) & MOTTLING(CM)		* 0
ROOTING DEPTH(CM)	20.0	20
VEGETATION :		
ASSOCIATION		LT
STAND AGE(YR)	48.0	48
CANOPY HEIGHT(M)	9.0	9
MEAN ANNUAL INCREMENT	0.0	
STRATA COVERAGE(%)-A	50.0	50
-B	11.0	11
-C	20.0	20
-G	80.0	80
-D	55.0	55
-L	1.0	1
SURFACE SUBST(%)-DEAD WOOD	2.0	2
-BEDROCK	0.0	0
-STONES	0.0	0
-MIN.SOIL	0.0	0
-ORGANIC	96.0	96
-OPEN WATER	2.0	2
BIOMASS(KG/HA)-FORBS	0.0	
-GRAMINOIDS	0.0	
-BROWSE	0.0	

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ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY

TITLE : Sb PICEA MARIANA/LEDUM GROENLANDICUM/SPHAGNUM TABLE 11

	MEAN	5K W025 8019 W 5	5K W040 7718 W 5	5K W044 7720 W 5
PLOT NUMBER				
TOWNSHIP & RANGE				
MERIDIAN				
MAPSHEET		83 N 15	83 N 10	83 N 10
PHYSIOGRAPHIC SUBREGION		BP	FP	FP
GEOMORPHIC SYSTEM				
ECOSECTION		01	GL1	01
ELEVATION(MASL)	622.3	638	612	617
SLOPE(%)	0.7	1	1	0
ASPECT(DEG)		90	290	
ENVIRONMENT/SOILS :				
ECOLOGICAL MOISTURE REGIME		SHD	SHD	SHD
NUTRIENT REGIME		SM	M	M
OVERLYING MATERIAL		01	0	01
UNDERLYING MATERIAL				
EROSION/DEPOSITION				
SOIL SUBGROUP		TY	TY	TY
SOIL GREAT GROUP		F	F	F
SOIL DRAINAGE		VP	VP	VP
SOLUM THICKNESS(CM)	160.0	160	160	160
TYPE & DEPTH TO RESTRICT(CM)		W 10	W 30	W 30
THICKNESS LFH(CM)	160.0	160	160	160
pH-LFH	4.8	4.7	4.4	5.3
-A	5.0		4.7	5.3
-B	0.0			
-C	0.0			
TEXTURE-A/1		f		
-B/2		f		
-C/3				
COARSE FRAGMENTS-B(%)	0.0		0	0
SEEPAGE(*) & MOTTLING(CM)				
ROOTING DEPTH(CM)	43.3	0	30	100
VEGETATION :				
ASSOCIATION			SB	SB
STAND AGE(YR)	37.0	15	50	46
CANOPY HEIGHT(M)	6.0		7	5
MEAN ANNUAL INCREMENT	12.9	129		
STRATA COVERAGE(%)-A	5.3	10	5	1
-B	87.7	99	99	65
-C	11.7	20	10	5
-G	0.3	1	0	0
-D	70.0	80	50	80
-L	8.3	5	15	5
SURFACE SUBST(%)-DEAD WOOD	1.7	2	2	1
-BEDROCK	0.0	0	0	0
-STONES	0.0	0	0	0
-MIN.SOIL	0.0	0	0	0
-ORGANIC	98.0	97	98	99
-OPEN WATER	0.3	1	0	0
BIOMASS(KG/HA)-FORBS	0.0			
-GRAMINOIDS	0 0			
-BROWSE	0.0			

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ENVIRONMENT/SOILS-VEGETATION TABLES

RESOURCE INVENTORY
TABLE 12

TITLE : DISTURBED STANDS

	MEAN	5K WO14 7919 W 5	5K WO20 8018 W 5	5K WO41 7717 W 5	5K WO42 7718 W 5
PLOT NUMBER					
TOWNSHIP & RANGE					
MERIDIAN					
MAPSHEET		83 N 15	83 N 15	83 N 10	83 N 10
PHYSIOGRAPHIC SUBREGION		BP	BP	FP	FP
GEOMORPHIC SYSTEM					
ECOSECTION		GLM1	M2	GL1	GL1
ELEVATION(MASL)	639.8	645	668	620	626
SLOPE(%)	2.8	2	2	2	5
ASPECT(DEG)		80	308	78	20
ENVIRONMENT/SOILS :					
ECOLOGICAL MOISTURE REGIME		SHG	M		
NUTRIENT REGIME		PM	M		
OVERLYING MATERIAL		GLi	Mi	GLh	GLu
UNDERLYING MATERIAL					
EROSION/DEPOSITION		0			
SOIL SUBGROUP		L	GL	O	O
SOIL GREAT GROUP		G I	GL	GL	GL
SOIL DRAINAGE			I	W	W
SOLUM THICKNESS(CM)	41.3	19	29	75	42
TYPE & DEPTH TO RESTRICT(CM)			R 30		
THICKNESS LFH(CM)	9.5	9	7	10	12
pH-LFH	0.0				
-A	6.8	6.5	7.0	7.0	6.5
-B	6.5	7.0	5.5	7.0	6.5
-C	6.8	7.0	5.0	8.0	7.0
TEXTURE-A/1		SiL	SCL	SiL	SiL
-B/2		C	CL	SiCL	SiCL
-C/3		HC	C	SiC	SiC
COARSE FRAGMENTS-B(%)	3.8	0	15	0	0
SEEPAGE(*) & MOTTLING(CM)					
ROOTING DEPTH(CM)	48.8	25	30	70	70
VEGETATION :					
ASSOCIATION					
STAND AGE(YR)	101.5	99	43	135	129
CANOPY HEIGHT(M)	23.8	27	13	30	25
MEAN ANNUAL INCREMENT	0.0				
STRATA COVERAGE(%)-A	42.5	30	50	50	40
-B	60.0	80	50	45	65
-C	27.5	20	40	25	25
-G	9.3	20	15	1	1
-D	0.0	0	0	0	0
-L	0.0	0	0	0	0
SURFACE SUBST(%)-DEAD WOOD	4.8	7	5	2	5
-BEDROCK	0.0	0	0	0	0
-STONES	0.0	0	0	0	0
-MIN.SOIL	0.0	0	0	0	0
-ORGANIC	95.3	93	95	98	95
-OPEN WATER	0.0	0	0	0	0
BIOMASS(KG/HA)-FORBS	0.0				
-GRAMINOIDS	0.0				
-BROWSE	0.0				

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VEGETATION TABLES

RESOURCE INVENTORY

EDMONTON, ALBERTA

08:39:08 SEP 2, 1986

RESEARCH BRANCH

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A1	

POPULUS TREMULOIDES/SHEPHERDIA

RESOURCE INVENTORY
EDMONTON, ALBERTA
08:39:08 SEP 2, 1986

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V) TABLE 1 PAGE 1

PLOT NUMBER	AVERAGE VALUE		5K WO17		5K WO33		5K WO56	
NUMBER OF SPECIES PER PLOT	29.3		31		30		27	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV
A1 LAYER								
1 POPU TRE	100.0	43.3	50	2	40	2	40	2
2 PICE GLA	33.3	0.3	1	2				
A2 LAYER								
POPU TRE	33.3	1.7	5					
PICE GLA	33.3	1.0			3	2		
E LAYER								
3 PYLA POL	100.0	5.0	5		5		5	
4 PHYS ADS	66.7	3.3			5		5	
5 XANT POL	66.7	3.3			5		5	
6 PARM SUL	33.3	0.3	1					
B1 LAYER								
7 SALI BEB	33.3	1.7					5	2
8 AMEL ALN	33.3	1.0					3	2
PICE GLA	33.3	1.0			3	2		
POPU TRE	33.3	0.7			2	2		
B2 LAYER								
9 SHEP CAN	100.0	23.3	25	2	25	2	20	2
10 ROSA ACI	100.0	11.7	5	2	15	2	15	2
11 VIBU EDU	100.0	6.7	10	2	5	2	5	2
POPU TRE	66.7	3.7	1	2			10	2
AMEL ALN	66.7	3.3			3	2	7	2
12 CORN STO	66.7	1.3			3	2	1	2
13 LONI DIO	66.7	1.0			2	2	1	2
14 RIBE OXY	66.7	0.7			1	2	1	2
15 SYMP ALB	66.7	0.7			1	2	1	2
PICE GLA	33.3	1.7			5	2		
SALI BEB	33.3	1.7					5	2
16 SALI GLA	33.3	1.3	4	2				
17 LEDU GRO	33.3	0.3	1	2				
18 LONI INV	33.3	0.3	1	2				
19 RIBE TRI	33.3	0.3			1	2		
C LAYER								
20 LINN BOR	100.0	7.0	5	2	15	2	1	2
21 EPIL ANG	100.0	4.3	3	2	5	2	5	2
22 FRAG VIR	100.0	1.3	1	2	2	2	1	2
23 GALI BOR	100.0	1.3	1	2	2	2	1	2
24 MAIA CAN	100.0	1.0	1	2	1	2	1	2
25 VICI AME	100.0	1.0	1	2	1	2	1	2
26 ARAL NUD	66.7	13.3			10	2	30	2
27 RUBU PUB	66.7	2.7			5	2	3	2
28 CORN CAN	66.7	1.0	1	2			2	2
29 PYRO ASA	66.7	1.0	1	2	2	2		
30 LATH OCH	66.7	0.7	1	2	1	2		
31 ASTE CON	33.3	0.7					2	2
32 ARCT UVA	33.3	0.3	1	2				
33 ARNI COR	33.3	0.3	1	2				
34 ASTR AME	33.3	0.3	1	2				

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A1	

POPULUS TREMULOIDES/SHEPHERDIA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO17		5K WO33		5K WO56	
NUMBER OF SPECIES PER PLOT	29.3		31		30		27	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV
35 MERT PAN	33.3	0.3	1	2				
36 ORTH SEC	33.3	0.3	1	2				
37 PETA PAL	33.3	0.3	1	2				
38 VACC CAE	33.3	0.3	1	2				
39 VACC VIT	33.3	0.3	1	2				
40 VIOL REN	33.3	0.3			1	2		
G LAYER								
41 CALA CAN	66.7	6.7			5	2	15	2
42 ELYM INN	33.3	3.3	10	2				
D LAYER								
43 BRAC CAM	33.3	0.3			1	2		
44 HYLO SPL	33.3	0.3	1	2				

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A2	

POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, CALAMAGROSTIS PHASE

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

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	AVERAGE		5K		5K		5K		5K		5K		5K		5K		5K		5K		5K	
PLOT NUMBER	VALUE		WO53		WO30		WO31		WO21		WO26		WO54		WO24		WO07		WO49		WO23		WO50		WO04	
NUMBER OF SPECIES PER PLOT	32.7		44		33		34		37		26		28		33		28		35		34		28		32	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
A1 LAYER																										
1 POPU TRE	100.0	35.8	20	2	70	2	45	2	20	2	30	2	40	2	30	2	35	2	40	2	35	2	30	2	35	2
2 POPU BAL	16.7	0.3	1	2																					2	2
3 PICE GLA	8.3	0.4					5	2																		
A2 LAYER																										
POPU TRE	66.7	8.5	2	2			5	2	10	2	10	2			10	2	5	2	20	2			40	2		
4 BETU PAP	33.3	0.4			1	2			1	2	1	2											2	2		
5 SALI BEB	16.7	0.8									5	2							5	2						
PICE GLA	8.3	0.2																			2	2				
POPU BAL	8.3	0.2	2	2																						
E LAYER																										
6 PYLA POL	91.7	4.6	5		5		5		5		5		5		5		5		5		5		5			
7 PHYS ADS	50.0	1.8			5		5				5		5				1				1					
8 XANT POL	50.0	1.5			5		5						5				1				1				1	
9 ORTH OBT	41.7	2.1	5						5						5				5		5					
10 PARM SUL	16.7	0.8									5														5	
11 PARM HYP	8.3	0.4																					5			
12 USNE SOR	8.3	0.1																							1	
B1 LAYER																										
SALI BEB	66.7	5.3	15	2	2	2			10	2	2	2			10	2			5	2			15	2	5	2
POPU TRE	33.3	1.0	3	2			2														5	2			2	2
POPU BAL	16.7	0.6	2	2											5	2										
13 SALI SPP	8.3	0.2																			2	2				
14 AMEL ALN	8.3	0.1											1	2												
B2 LAYER																										
15 ROSA ACI	100.0	18.3	20	2	20	2	10	2	10	2	5	2	15	2	20	2	50	3	15	2	20	2	30	2	5	2
AMEL ALN	91.7	5.8	5	2	5	2	5	2	10	2			10	2	5	2	10	2	3	2	10	2	5	2	1	2
16 VIBU EDU	83.3	7.9	5	2	10	2			7	2	10	2			15	2	5	2	7	2	15	2	20	2	1	2
17 SYMP ALB	83.3	1.8	2	2	2	2	2	2	2	2			3	2	3	2	5	2	1	2			1	2	1	2
18 RUBU IDA	75.0	2.2	2	2	5	2	1	2	3	2			10	2			1	2	1	2	2	2			1	2
19 LONI DIO	75.0	1.4	1	2	2	2	1	2	2	2			2	2	2	2	3	2	3	2			1	2		
20 LONI INV	58.3	4.0	10	2	3	2	2	2	7	2					15	2			10	2					1	2
POPU TRE	58.3	3.3	5	2	1	2	15	2	5	2			3	2	5	2					5	2				
21 CORN STO	58.3	3.2	7	2	5	2	5	2	10	2					5	2	1	2			5	2				
22 SHEP CAN	58.3	2.8	3	2					15	2	3	2			2	2	7	3					2	2	1	2
23 RIBE OXY	58.3	2.0	2	2	10	2	5	2	3	2			1	2	2	2			1	2						
PICE GLA	50.0	0.8			1	2	3	2	1	2					2	2			2	2	1	2				
SALI BEB	41.7	1.2													5	2	1	2	2	2			5	2	1	2
POPU BAL	33.3	0.7	2	2	1	2					2	2			3	2										
24 RIBE TRI	33.3	0.6	1	2					2	2	1	2									3	2				
25 ROSA WOO	25.0	1.1	10	2	2	2	1	2																		
BETU PAP	25.0	0.3			1	2			1	2	1	2														
26 PRUN VIR	16.7	0.3											1	2							3	2				
27 RIBE LAC	16.7	0.2					1	2	1	2																
28 LEDU GRO	8.3	1.3									15	2	....													
29 CORY COR	8.3	0.8																			10	2				
SALI SPP	8.3	0.3																			3	2				
30 ALNU TEN	8.3	0.2																			2	2				

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A2	

POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, CALAMAGROSTIS PHASE

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

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PLOT NUMBER	AVERAGE VALUE		5K WO53		5K WO30		5K WO31		5K WO21		5K WO26		5K WO54		5K WO24		5K WOO7		5K WO49		5K WO23		5K WO50		5K WOO4	
NUMBER OF SPECIES PER PLOT	32.7		44		33		34		37		26		28		33		28		35		34		28		32	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
31 RIBE GLA	8.3	0.1	1	2																						
C LAYER																										
32 RUBU PUB	100.0	6.0	5	2	25	2	5	2	3	2	5	2	5	2	3	2	1	2	5	2	3	2	10	2	2	2
33 CORN CAN	100.0	3.8	5	2	15	2	2	2	3	2	2	2	1	2	2	2	2	2	1	2	5	2	5	2	2	2
34 LATH OCH	100.0	1.8	1	2	2	2	3	2	2	2	1	2	1	2	1	2	1	2	3	2	2	2	3	2	2	2
35 GALI BOR	91.7	1.3	1	2	2	2	5	2	1	2			1	2	1	2	1	2	1	2	1	2	1	2	1	2
36 ASTE CON	83.3	1.5	2	2			2	2	3	2	2	2	1	2	3	2	1	2			2	2	1	2	1	2
37 EPIL ANG	75.0	5.1	10	2			1	2	10	2	5	2			10	2	3	2			10	2	5	2	7	2
38 VICI AME	66.7	0.9	1	2	3	2					1	2			1	2	1	2	1	2			2	2	1	2
39 ARAL NUD	58.3	1.6	2	2			1	2	3	2			1	2			5	2			5	2	2	2		
40 LINN BOR	58.3	1.4	2	2					2	2	3	2					1	2			5	2	3	2	1	2
41 FRAG VIR	58.3	1.1	1	2	3	2	3	2											2	2	2	2	1	2	1	2
42 PYRO ASA	58.3	0.6							1	2			1	2	1	2			1	2	1	2	1	2	1	2
43 PETA PAL	50.0	1.4	10	2	1	2			1	2					2	2			2	2					1	2
44 MAIA CAN	50.0	0.6											1	2			1	2	1	2	2	2	1	2	1	2
45 MITE NUD	50.0	0.6	1	2			2	2	1	2					1	2			1	2					1	2
46 ACTA RUB	41.7	1.2			2	2			2	2			7	2					2	2					1	2
47 MERT PAN	41.7	0.7	1	2			3	2			1	2			2	2			1	2						
48 ASTE SPP	41.7	0.6			2	2			1	2	1	2							2	2			1	2		
49 TARA OFF	41.7	0.4			1	2	1	2					1	2			1	2	1	2						
50 GALI TRI	25.0	0.3	1	2					1	2					1	2										
51 ASTE CIL	16.7	0.3	2	2																					1	2
52 ASTR AME	16.7	0.2			1	2					1	2														
53 DISP TRA	16.7	0.2											1	2							1	2				
54 EQUI ARV	16.7	0.2	1	2																					1	2
55 HERA LAN	16.7	0.2	1	2			1	2																		
56 THAL VEN	16.7	0.2					1	2											1	2						
57 VIOL CAN	8.3	0.8											10	2												
58 PETA VIT	8.3	0.2			2	2																				
59 ACHI MIL	8.3	0.1																	1	2						
60 EQUI SYL	8.3	0.1																	1	2						
61 MOEH LAT	8.3	0.1															1	2								
62 ORTH SEC	8.3	0.1											1	2												
63 SOLI CAN	8.3	0.1					1	2																		
64 SOLI GIG	8.3	0.1	1	2																						
65 TRIE BOR	8.3	0.1																			1	2				
66 VIOL REN	8.3	0.1	1	2																						
G LAYER																										
67 CALA CAN	100.0	10.1	15	2	10	2	15	2	10	2	20	2	5	2	5	2	15	2	10	2	10	2	1	2	5	2
68 ELYM INN	16.7	0.6													2	2							5	2		
69 AGRO TRA	8.3	0.4											5	2												
D LAYER																										
70 BRAC CAM	16.7	0.2																								
71 EURH PUL	8.3	0.1							1	2							1	2	1	2						

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A3	

POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, ARALIA PHASE

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

RESOURCE INVENTORY
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PLOT NUMBER	AVERAGE VALUE		5K WO01		5K WO12		5K WO05		5K WO43		5K WO02		5K WO03		5K WO06		5K WO11		5K WO38		5K WO39	
NUMBER OF SPECIES PER PLOT	33.7		23		39		37		35		31		33		37		40		33		29	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
A1 LAYER																						
1 POPU TRE	100.0	53.8	60	2	60	2	60	2	60	2	50	2	55	2	48	2	35	2	50	2	60	2
2 POPU BAL	40.0	1.1			1	1	7	2					1	2	2	2						
3 BETU PAP	10.0	1.5															15	2				
A2 LAYER																						
BETU PAP	30.0	2.1							1	2							15	2	5	2		
POPU TRE	30.0	1.4					5	2							7	2	2	2				
POPU BAL	30.0	1.0					5	2					3	2	2	2						
4 SALI BEB	20.0	0.3							2	2							1	2				
E LAYER																						
5 PYLA POL	90.0	4.5	5		5		5		5		5		5		5				5		5	
6 XANT POL	60.0	2.3			1				1		5		1						5		10	
7 PHYS ADS	60.0	1.8			1				1		5		1						5		5	
8 ORTH OBT	20.0	1.0							5												5	
9 PARM SUL	20.0	1.0													5		5					
10 RAMA FAR	10.0	0.5															5					
11 USNE SOR	10.0	0.5													5							
12 BRYO FUS	10.0	0.1															1					
13 PARM INF	10.0	0.1															1					
B1 LAYER																						
14 AMEL ALN	30.0	0.3							1	2	1	2							1	2		
SALI BEB	20.0	0.8			1	2									7	2						
POPU TRE	20.0	0.2	1	2																	1	2
BETU PAP	10.0	0.3															3	2				
POPU BAL	10.0	0.1											1	2								
B2 LAYER																						
15 VIBU EDU	100.0	7.0	2	2	2	2	5	2	2	2	1	2	30	2	5	2	15	2	3	2	5	2
AMEL ALN	90.0	3.7	2	2	2	2	3	2	10	2	1	2			1	2	2	2	9	2	7	2
16 RUBU IDA	90.0	3.7	2	2	15	2	2	2	5	2	1	2	1	2	1	1			5	2	5	2
17 SYMP ALB	90.0	1.7	1	2	1	2	1	2	5	2			4	2	1	2	2	2	1	2	1	2
18 ROSA ACI	80.0	12.4	35	2	5	2			10	2	20	2	5	2			4	2	15	2	30	2
19 LONI INV	80.0	1.0	1	2	2	2	1	2			1	2	1	2			2	2	1	2	1	2
20 CORN STO	70.0	2.6	15	2	5	2			1	2			1	2			1	2	1	2	2	2
21 SHEP CAN	60.0	2.2	2	2	3	2			5	2	10	2			1	2	1	2				
22 ROSA WOO	50.0	10.1					40	2	40	2	1	2			15	2					5	2
POPU TRE	50.0	0.9			4	2	2	2	1	2	1	2					1	2				
23 RIBE OXY	50.0	0.6	1	2	1	2	1	2							1	2			2	2		
24 PICE GLA	40.0	0.9													2	2	5	2	1	2	1	2
SALI BEB	30.0	0.3			1	2			1	2					1	2						
25 RIBE LAC	20.0	0.3			1	2															2	2
26 LONI DIO	20.0	0.2							1	2									1	2		
POPU BAL	20.0	0.2					1	2					1	2								
27 PRUN VIR	10.0	0.1																			1	2
28 RIBE TRI	10.0	0.1							1	2												
C LAYER																						
29 RUBU PUB	100.0	2.4	1	2	2	2	3	2	2	2	1	2	1	2	3	2	3	2	3	2	5	2
30 LATH OCH	100.0	1.2	1	2	2	2	1	2	1	2	2	2	1	2	1	2	1	2	1	2	1	2
31 ARAL NUD	90.0	15.9	10	2	7	2			40	2	30	2	10	2	10	2	7	2	35	2	10	2

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A3	

POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, ARALIA PHASE

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO01		5K WO12		5K WO05		5K WO43		5K WO02		5K WO03		5K WO06		5K WO11		5K WO38		5K WO39	
NUMBER OF SPECIES PER PLOT	33.7		23		39		37		35		31		33		37		40		33		29	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
32 CORN CAN	90.0	2.4	1	2	7	2	2	2			2	2	2	2	2	2	5	2	1	2	2	2
33 GALI BOR	90.0	0.9	1	2	1	2	1	2	1	2	1	2			1	2	1	2	1	2	1	2
34 LINN BOR	80.0	1.4	1	2	2	2			1	2	1	2			5	2	1	2	2	2	1	2
35 VICI AME	80.0	0.9			2	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2		
36 FRAG VIR	80.0	0.8	1	2	1	2			1	2	1	2	1	2	1	2	1	2	1	2		
37 MAIA CAN	70.0	0.8	1	2	1	2	1	2			2	2			1	2	1	2			1	2
38 PYRO ASA	70.0	0.8			1	2	1	2	1	2	1	2			1	2	2	2			1	2
39 ASTE CON	60.0	1.0	1	2	1	2							1	2			4	2	2	2	1	2
40 EPIL ANG	50.0	1.0	1	2					1	2	4	2					3	2			1	2
41 ASTE SPP	50.0	0.5			1	2							1	2	1	2	1	1	1	2		
42 GALI TRI	50.0	0.5			1	2					1	2	1	2			1	2	1	2		
43 MITE NUD	50.0	0.5			1	2	1	2					1	2			1	2	1	2		
44 DISP TRA	40.0	0.4			1	2																
45 PETA PAL	40.0	0.4			1	2	1	2			1	2	1	2			1	2	1	2	1	2
46 MERT PAN	30.0	0.5					1	2					1	2	3	2						
47 VIOL REN	30.0	0.4					2	2			1	2							1	2		
48 EQUI ARV	30.0	0.3					1	2					1	2			1	2				
49 EQUI SYL	30.0	0.3					1	2					1	2			1	2				
50 ORTH SEC	30.0	0.3											1	2	1	2	1	2				
51 TARA OFF	30.0	0.3			1	2			1	2	1	2										
52 VIOL CAN	20.0	0.6											5	2			1	2				
53 ACHI MIL	20.0	0.2			1	2			1	2												
54 ACTA RUB	20.0	0.2					1	2														
55 ASTE CIL	20.0	0.2							1	2	1	2							1	2		
56 CALA CAN	20.0	0.2	1	2									1	2								
57 DELP GLA	10.0	0.1					1	2														
58 ELYM INN	10.0	0.1											1	2								
59 GEUM ALE	10.0	0.1			1	2																
60 HERA LAN	10.0	0.1					1	2														
61 HIER UMB	10.0	0.1									1	2										
62 MOEH LAT	10.0	0.1													1	2						
63 SMIL STE	10.0	0.1											1	2								
64 SOLI GIG	10.0	0.1							1	2												
65 THAL VEN	10.0	0.1					1	2														
G LAYER																						
CALA CAN	70.0	2.1			6	2	1	2	1	2	5	2			1	2	2	2	5	2		
66 AGRO TRA	30.0	0.3							1	2												
ELYM INN	20.0	0.2					1	2											1	2	1	2
67 POA PRA	10.0	0.1			1	2									1	2						
D LAYER																						
68 BRAC CAM	20.0	0.2					1	2							1	2						
69 BRYU CRE	10.0	0.1					1	2														
70 EURH PUL	10.0	0.1													1	2						
71 HYLO SPL	10.0	0.1													1	2						
72 PLAG CUS	10.0	0.1					1	2					...									
L LAYER																						
73 PELT CAN	20.0	0.2					1	2							1	2						

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A4	

POPULUS TREMULOIDES-P. BALSAMIFERA/VIBURNUM EDULE-ROSA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

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PLOT NUMBER	AVERAGE VALUE		5K WO08		5K WO18		5K WO51		5K WO36		5K WO34		5K WO47	
NUMBER OF SPECIES PER PLOT	31.5		26		37		29		33		35		29	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
A1 LAYER														
1 POPU TRE	100.0	32.5	30	2	25	2	20	2	40	2	40	2	40	2
2 POPU BAL	100.0	17.5	20	2	15	2	10	2	20	2	20	2	20	2
A2 LAYER														
POPU TRE	33.3	1.7	5	2	5	2								
3 SALI BEB	33.3	0.7							2	2	2	2		
POPU BAL	16.7	0.8			5	2								
4 SALI SPP	16.7	0.8	5											
5 ALNU TEN	16.7	0.3			2	2								
E LAYER														
6 PYLA POL	100.0	5.0	5		5		5		5		5		5	
7 PARM SUL	50.0	2.5	5		5				5					
8 PHYS ADS	33.3	1.7							5		5			
9 XANT POL	16.7	0.2									1			
B1 LAYER														
SALI BEB	66.7	1.5					2	2	3	2	3	2	1	2
SALI SPP	16.7	2.5	15	2										
10 PICE GLA	16.7	0.2			1	2								
B2 LAYER														
11 ROSA ACI	100.0	12.8	10		10	2	35	3	7	2	10	2	5	2
12 VIBU EDU	100.0	9.7	15	2	5	2	20	2	5	2	10	2	3	2
13 CORN STO	66.7	5.7			3	2			15	2	15	2	1	2
14 RUBU IDA	66.7	1.8			2	2			1	2	7	2	1	2
15 RIBE OXY	66.7	1.2			1	2			2	2	3	2	1	2
16 SYMP ALB	66.7	0.7	1	2			1	2	1	2	1	2		
17 LONI INV	50.0	4.5			10	2			7	2	10	2		
PICE GLA	50.0	1.3			2	2	1	2			5	2		
18 LONI DIO	50.0	0.5			1	2	1	2			1	2		
19 RIBE TRI	50.0	0.5							1	2	1	2	1	2
20 SHEP CAN	33.3	3.7			20	2			2	2				
21 AMEL ALN	33.3	2.0							10	2			2	2
ALNU TEN	33.3	0.7			3	2					1	2		
POPU BAL	33.3	0.3							1	2	1	2		
SALI BEB	33.3	0.3					1	2					1	2
22 SALI MYR	16.7	0.8			5	2								
23 BETU PAP	16.7	0.2									1	2		
POPU TRE	16.7	0.2					1	2						
24 RIBE LAC	16.7	0.2									1	2		
SALI SPP	16.7	0.2	1	2										
C LAYER														
25 CORN CAN	100.0	8 2	3	2	30	2	5	2	5	2	5	2	1	2
26 RUBU PUB	100.0	3.7	2	2	3	2	5	2	5	2	5	2	2	2
27 LINN BOR	83.3	6.7	10	2	15	2	5	2	5	2	5	2		
28 EPIL ANG	83.3	5.8	2	2	10	2	10	2			3	2	10	2
29 LATH OCH	83.3	1.5	1	2	1	2	3	2	1	2			3	2
30 PETA PAL	83.3	1.0	1	2	1	2	2	2	1	2			1	2
31 ARAL NUD	66.7	18.8	45	2			3	2			15	2	50	2
32 FRAG VIR	66.7	1.3	1	2	5	2	1	2					1	2

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A4	

POPULUS TREMULOIDES-P. BALSAMIFERA/VIBURNUM EDULE-ROSA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO08		5K WO18		5K WO51		5K WO36		5K WO34		5K WO47	
NUMBER OF SPECIES PER PLOT	31.5		26		37		29		33		35		29	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
33 VICI AME	66.7	1.0	1	2	1	2			1	2			3	2
34 PYRO ASA	66.7	0.8	1	2			1	2	2	2	1	2		
35 GALI BOR	66.7	0.7	1	2			1	2			1	2	1	2
36 MAIA CAN	66.7	0.7	1	2			1	2	1	2			1	2
37 MERT PAN	66.7	0.7			1	2	1	2	1	2			1	2
38 GALI TRI	50.0	0.5			1	2			1	2	1	2		
39 ASTE CON	33.3	2.7					1	2					15	2
40 MITE NUD	33.3	1.0			1	2					5	2		
41 VIOL CAN	33.3	0.5							2	2			1	2
42 ASTE CIL	33.3	0.3							1	2	1	2		
43 EQUI ARV	33.3	0.3					1	2	1	2				
44 EQUI PRA	33.3	0.3					1	2					1	2
45 VIOL REN	33.3	0.3	1	2							1	2		
46 ACTA RUB	16.7	0.5			3	2								
47 ASTE SPP	16.7	0.3			2	2								
48 EQUI SYL	16.7	0.2					1	2						
49 MENT ARV	16.7	0.2									1	2		
50 MOEH LAT	16.7	0.2			1	2								
51 ORTH SEC	16.7	0.2			1	2								
52 SOLI CAN	16.7	0.2							1	2				
53 TARA OFF	16.7	0.2			1	2								
54 TRIE BOR	16.7	0.2									1	2		
G LAYER														
55 CALA CAN	83.3	4.2	7	2			3	2	8	2	2	2	5	2
56 AGRO TRA	33.3	0.5			2	2	1	2						
57 MELI SMI	16.7	0.5			3	2								
D LAYER														
58 BRAC CAM	33.3	0.3	1	2									1	2
59 HYLO SPL	16.7	0.2											1	2

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A5	

POPULUS TREMULOIDES-P.BALSAMIFERA/ALNUS/EPILOBIUM-CALAMAGROSTI

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO16		5K WO15		5K WO46		5K WO10	
NUMBER OF SPECIES PER PLOT	29.0		37		24		24		31	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV
A1 LAYER										
1 POPU BAL	100.0	16.3	5	2	35	2	10	2	15	2
2 POPU TRE	75.0	6.3	5	2			10	2	10	2
3 PICE GLA	25.0	0.5			2	2				
A2 LAYER										
POPU TRE	50.0	1.5	5	2	1	2				
POPU BAL	25.0	2.5	10	2						
4 ALNU TEN	25.0	1.3			5	2				
PICE GLA	25.0	0.5	2	2						
E LAYER										
5 PYLA POL	50.0	1.5	5						1	
6 CETR HAL	25.0	1.3	5							
7 ORTH OBT	25.0	1.3					5			
8 PARM SUL	25.0	1.3					5			
9 PHYS ADS	25.0	1.3					5			
10 POLY PIL	25.0	1.3			5					
B1 LAYER										
11 ALNU CRI	50.0	18.8	15	2			60	2		
ALNU TEN	50.0	2.5			5	2			5	2
POPU BAL	25.0	1.3							5	2
12 SALI BEB	25.0	1.3							5	2
PICE GLA	25.0	0.5	2	2						
POPU TRE	25.0	0.3							1	2
B2 LAYER										
13 ROSA ACI	100.0	21.3	10	2	45	2	10	2	20	2
14 RUBU IDA	100.0	10.3	3	2	10	2	25	2	3	2
15 VIBU EDU	100.0	8.8	10	2	5	2	10	2	10	2
16 LONI INV	100.0	3.8	3	2	10	2	1	2	1	2
17 AMEL ALN	75.0	2.0	5	2			1	2	2	2
18 SYMP ALB	75.0	2.0	3	2	3	2			2	2
19 RIBE TRI	75.0	1.3	1	2			3	2	1	2
20 RIBE OXY	50.0	3.0			2	2			10	2
21 CORN STO	50.0	2.0	7	2					1	2
PICE GLA	50.0	1.0	3	2					1	2
POPU BAL	50.0	1.0			2	2			2	2
POPU TRE	50.0	0.8					1	2	2	2
22 RIBE GLA	50.0	0.8			1	2	2	2		
23 CORY COR	25.0	3.8	15	2						
ALNU CRI	25.0	2.5					10	2		
ALNU TEN	25.0	1.3							5	2
24 LONI DIO	25.0	0.3							1	2
C LAYER										
25 EPIL ANG	100.0	10.0	5	2	5	2	10	2	20	2
26 ARAL NUD	100.0	5.0	5	2	3	2	2	2	10	2
27 RUBU PUB	100.0	2.5	2	2	2	2	5	2	1	2
28 GALI BOR	100.0	1.0	1	2	1	2	1	2	1	2
29 VIOL CAN	50.0	3.0			10	2			2	2
30 ASTE CON	50.0	0.5	1	2	1	2				

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		A5	

POPULUS TREMULOIDES-P.BALSAMIFERA/ALNUS/EPILOBIUM-CALAMAGROSTI

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO16		5K WO15		5K WO46		5K WO10	
NUMBER OF SPECIES PER PLOT	29.0		37		24		24		31	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV
31 GALI TRI	50.0	0.5	1	2					1	2
32 LATH OCH	50.0	0.5	1	2					1	2
33 MAIA CAN	50.0	0.5	1	2	1	2				
34 MITE NUD	50.0	0.5	1	2					1	2
35 MERT PAN	25.0	3.8					15	2		
36 ACTA RUB	25.0	0.3					1	2		
37 ASTE SPP	25.0	0.3	1	2						
38 CLEM OCC	25.0	0.3	1	2						
39 CORN CAN	25.0	0.3	1	2						
40 DELP GLA	25.0	0.3					1	2		
41 DISP TRA	25.0	0.3			1	2				
42 EQUI PRA	25.0	0.3			1	2				
43 EQUI SYL	25.0	0.3							1	2
44 FRAG VIR	25.0	0.3	1	2						
45 HIER UMB	25.0	0.3	1	2						
46 LINN BOR	25.0	0.3	1	2						
47 PYRO ASA	25.0	0.3	1	2						
48 VICI AME	25.0	0.3	1	2						
G LAYER										
49 CALA CAN	100.0	20.8	10	2	20	2	50	2	3	2
D LAYER										
50 BRAC CAM	25.0	0.3					1	2		

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		Pb	

POPULUS BALSAMIFERA/CORNUS STOLONIFERA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

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PLOT NUMBER	AVERAGE VALUE		5K WO52	
NUMBER OF SPECIES PER PLOT	22.0		22	
SPECIES	%P	MC	%C	SV
A1 LAYER				
1 POPU BAL	100.0	40.0	40	2
2 POPU TRE	100.0	5.0	5	2
A2 LAYER				
POPU TRE	100.0	1.0	1	2
E LAYER				
3 CETR HAL	100.0	5.0	5	
4 ORTH OBT	100.0	5.0	5	
5 PARM HYP	100.0	5.0	5	
6 PARM SUL	100.0	5.0	5	
B2 LAYER				
7 CORN STO	100.0	10.0	10	2
8 RUBU IDA	100.0	10.0	10	2
9 ROSA ACI	100.0	5.0	5	2
10 AMEL ALN	100.0	3.0	3	2
11 SYMP ALB	100.0	1.0	1	2
C LAYER				
12 ARAL NUD	100.0	40.0	40	2
13 EPIL ANG	100.0	20.0	20	2
14 EQUI PRA	100.0	20.0	20	2
15 EQUI ARV	100.0	2.0	2	2
16 VICI AME	100.0	2.0	2	2
17 ANEM CAN	100.0	1.0	1	2
18 DELP GLA	100.0	1.0	1	2
19 THAL VEN	100.0	1.0	1	2
20 URTI DIO	100.0	1.0	1	2
G LAYER				
21 CALA CAN	100.0	20.0	20	2

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		SwA	

PICEA GLAUCA-P. TREMULOIDES/VIBURNUM EDULE-ROSA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

RESOURCE INVENTORY
EDMONTON, ALBERTA
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PLOT NUMBER	AVERAGE VALUE		5K WO28		5K WO29		5K WO09		5K WO55		5K WO22		5K WO27	
NUMBER OF SPECIES PER PLOT	35.8		30		31		45		37		40		32	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
A1 LAYER														
1 PICE GLA	100.0	20.8	30	2	30	2	25	2	20	2	10	2	10	2
2 POPU TRE	100.0	11.7	5	2	15	2	5	2	5	2	25	2	15	2
3 POPU BAL	16.7	0.2							1	2				
A2 LAYER														
PICE GLA	100.0	5.5	5	2	5	2	5		2	2	15	2	1	2
4 BETU PAP	50.0	0.8	3	2			1	1	1	2				
POPU TRE	33.3	1.7							7	2	3			
E LAYER														
5 HYPO PHY	83.3	4.2	5		5		5		5		5			
6 USNE ALP	66.7	4.2	10		5		5		5					
7 PARM SUL	66.7	3.3	5		5		5				5			
8 CETR PIN	33.3	1.7	5						5					
9 ORTH OBT	33.3	1.7									5		5	
10 PYLA POL	33.3	1.7									5		5	
11 CETR HAL	16.7	0.8							5					
12 EURH PUL	16.7	0.8					5							
13 EVER MES	16.7	0.8					5							
14 NEPH RES	16.7	0.8					5							
15 ORTH SPE	16.7	0.8					5							
16 PHYS ADS	16.7	0.8											5	
17 PLAG CUS	16.7	0.8					5							
18 RAMA FAR	16.7	0.8					5							
B1 LAYER														
BETU PAP	33.3	0.3					1	2	1	2				
19 SALI BEB	16.7	0.3							2	2				
PICE GLA	16.7	0.2					1	2						
B2 LAYER														
20 ROSA ACI	100.0	8.5	10	2	5	2	3	2	3	2	5	2	25	2
21 VIBU EDU	100.0	6.5	3	2	5	2	1	2	5	2	5	2	20	2
22 SHEP CAN	83.3	7.7	1	2	5	2			10	2	10	2	20	2
23 CORN STO	83.3	2.3			5	2	2	2	1	2	5	2	1	2
POPU TRE	83.3	2.2	5	2			1	2	2	2	3	2	2	2
24 LONI INV	66.7	2.0					2	2	2	2	3	2	5	2
25 RUBU IDA	66.7	1.0	2	2	1	2	1	2					2	2
26 RIBE OXY	66.7	0.8			1	2	2	2			1	2	1	2
27 RIBE TRI	66.7	0.8	1	2	1	2	1	2			2	2		
28 SYMP ALB	66.7	0.8			1	2	1	2			1	2	2	2
PICE GLA	50.0	0.8			1	2			2	2	2	2		
29 LONI DIO	50.0	0.7			1	2					1	2	2	2
30 RIBE LAC	50.0	0.5	1	2			1	2	1	2				
31 AMEL ALN	33.3	0.8									3	2	2	2
32 LEDU GRO	16.7	0.3							2	2				
POPU BAL	16.7	0.2							1	2				
C LAYER														
33 LINN BOR	100.0	11.8	40	2	10	2	1	2	10	2	5	2	5	2
34 CORN CAN	100.0	6.3	5	2	15	2	10	2	2	2	3	2	3	2
35 RUBU PUB	100.0	5.3	10	2	10	2	5	2	2	2	3	2	2	2

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		SwA	

PICEA GLAUCA-P. TREMULOIDES/VIBURNUM EDULE-ROSA

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K W028		5K W029		5K W009		5K W055		5K W022		5K W027	
NUMBER OF SPECIES PER PLOT	35.8		30		31		45		37		40		32	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
36 FRAG VIR	100.0	2.7	3	2	5	2	1	2	2	2	2	2	3	2
37 GALI BOR	100.0	1.2	1	2	1	2	1	2	1	2	1	2	2	2
38 EPIL ANG	66.7	1.7					1	2	2	2	2	2	5	2
39 MITE NUD	66.7	1.3	1	2	1	2	5	2			1	2		
40 PETA PAL	66.7	0.7	1	2	1	2					1	2	1	2
41 PYRO ASA	66.7	0.7					1	2	1	2	1	2	1	2
42 VIOL REN	66.7	0.7			1	2			1	2	1	2	1	2
43 ARAL NUD	50.0	3.7					2	2			5	2	15	2
44 ASTE CON	50.0	1.0					1	2	3	2			2	2
45 MERT PAN	50.0	0.8	3	2			1	2	1	2				
46 MAIA CAN	50.0	0.7			1	2	1	2					2	2
47 ASTE SPP	33.3	0.5	2	2							1	2		
48 LATH OCH	33.3	0.5			1	2							2	2
49 LYCO ANN	33.3	0.3					1	2					1	2
50 ORTH SEC	33.3	0.3	1	2							1	2		
51 ASTE CIL	16.7	0.3			2	2								
52 EQUI SYL	16.7	0.2					1	2						
53 GOOD REP	16.7	0.2									1	2		
54 PYRO CHL	16.7	0.2	1	2										
55 VACC VIT	16.7	0.2							1	2				
G LAYER														
56 CALA CAN	66.7	1.2			1	2	3	2	1	2			2	2
57 ELYM INN	33.3	0.3	1	2							1	2		
58 ORYZ ASP	16.7	0.3			2	2								
59 AGRO TRA	16.7	0.2							1	2				
60 CALA STR	16.7	0.2									1	2		
D LAYER														
61 HYLO SPL	83.3	18.3	30	2	5	2	30	2	40	2	5	2		
62 PLEU SCH	83.3	18.3	10	2	5	2	40	2	50	2	5	2		
63 PTIL CRI	33.3	1.0					5	2			1	2		
64 AULA PAL	33.3	0.7	3	2			1	2						
65 RHYT TRI	16.7	0.2					1	2						
L LAYER														
66 PELT APH	16.7	0.2									1	2		

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		Sw	

PICEA GLAUCA/VIBURNUM-ROSA/HYLOCOMIUM-PLEUROZIUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO19		5K WO32		5K WO35		5K WO13		5K WO45		5K WO48	
NUMBER OF SPECIES PER PLOT	32.8		18		37		34		41		38		29	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
A1 LAYER														
1 PICE GLA	100.0	42.0	20	2	47	2	55		50	2	40	2	40	2
2 POPU TRE	66.7	1.5					5	2	1	2	2	2	1	2
A2 LAYER														
PICE GLA	66.7	3.0			3	2	5	2	5	2			5	2
3 BETU PAP	16.7	6.7	40	2										
E LAYER														
4 PARM SUL	100.0	5.0	5		5		5		5		5		5	
5 USNE ALP	100.0	5.0	5		5		5		5		5		5	
6 CETR HAL	33.3	1.7									5		5	
7 XANT FAL	16.7	1.7			10									
8 HYPO PHY	16.7	0.8					5							
9 ORTH OBT	16.7	0.8					5							
10 PYLA POL	16.7	0.8					5							
11 RAMA FAR	16.7	0.8			5									
B1 LAYER														
PICE GLA	66.7	0.8			1	2			1	2	2	2	1	2
12 ALNU TEN	16.7	0.2									1	2		
BETU PAP	16.7	0.2	1	2										
B2 LAYER														
13 ROSA ACI	100.0	8.0	10	2	3	2	10	2	5	2	10	2	10	2
14 VIBU EDU	83.3	3.7			2	2	15	2	1	2	1	2	3	2
15 LONI INV	83.3	2.3	1	2	3	2	5	2	2	2	3	2		
POPU TRE	83.3	1.5			2	2	2	2	1	2	1	2	3	2
16 RIBE TRI	83.3	0.8	1	2	1	2			1	2	1	2	1	2
17 AMEL ALN	66.7	0.7	1	2	1	2			1	2			1	2
18 RIBE OXY	50.0	0.8	1	2	3	2			1	2				
19 SHEP CAN	50.0	0.7			2	2			1	2			1	2
20 SYMP ALB	50.0	0.7			1	2			1	2	2	2		
21 LONI DIO	50.0	0.5			1	2					1	2	1	2
22 CORN STO	33.3	0.8			4	2			1	2				
PICE GLA	33.3	0.7					1	2	3	2				
23 RUBU IDA	16.7	0.5			3	2								
BETU PAP	16.7	0.2			1	2								
24 RIBE LAC	16.7	0.2									1	2		
C LAYER														
25 LINN BOR	100.0	11.3	1	2	10	2	50	2	1	2	5	2	1	2
26 RUBU PUB	100.0	3.8	1	2	10	2	3	2	2	2	5	2	2	2
27 CORN CAN	100.0	2.8	1	2	5	2	5	2	2	2	2	2	2	2
28 LATH OCH	83.3	0.8			1	2	1	2	1	2	1	2	1	2
29 MERT PAN	66.7	4.7					1	2	1	2	25	2	1	2
30 ARAL NUD	66.7	1.3			2	2	1	2	2	2			3	2
31 ACTA RUB	66.7	1.0			2	2			2	2	1	2	1	2
32 MAIA CAN	66.7	0.8					1	2	1	2	1	2	2	2
33 MITE NUD	66.7	0.8			1	2	2	2	1	2	1	2		
34 EQUI SYL	66.7	0.7			1	2	1	2	1	2	1	2		
35 GALI BOR	66.7	0.7			1	2	1	2	1	2	1	2		
36 EPIL ANG	50.0	0.8	1	2							3	2	1	2

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		Sw	

PICEA GLAUCA/VIBURNUM-ROSA/HYLOCOMIUM-PLEUROZIUM

RESOURCE INVENTORY
EDMONTON, ALBERTA
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PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V) TABLE 8 PAGE 2

PLOT NUMBER	AVERAGE VALUE		5K WO19		5K WO32		5K WO35		5K WO13		5K WO45		5K WO48	
NUMBER OF SPECIES PER PLOT	32.8		18		37		34		41		38		29	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV	%C	SV
37 FRAG VIR	50.0	0.7			2	2			1	2	1	2		
38 PETA PAL	50.0	0.7							2	2	1	2	1	2
39 PYRO ASA	50.0	0.5					1	2	1	2			1	2
40 ASTE CON	33.3	1.0							1	2	5	2		
41 GALI TRI	33.3	0.7			3	2	1	2						
42 GOOD REP	33.3	0.3					1	2	1	2				
43 PYRO CHL	33.3	0.3							1	2	1	2		
44 VIOL REN	33.3	0.3					1	2	1	2				
45 EQUI ARV	16.7	1.2	7	2										
46 ARNI COR	16.7	0.2									1	2		
47 ASTE CIL	16.7	0.2					1	2						
48 ASTE SPP	16.7	0.2									1	2		
49 DELP GLA	16.7	0.2									1	2		
50 DISP TRA	16.7	0.2							1	2				
51 LYCO ANN	16.7	0.2									1	2		
52 ORTH SEC	16.7	0.2					1	2						
53 VACC VIT	16.7	0.2	1	2										
54 VICI AME	16.7	0.2			1	2								
G LAYER														
55 ELYM INN	33.3	3.5							1	2	20	2		
56 CALA CAN	33.3	0.5			1	2							2	2
57 CALA STR	16.7	0.2					1	2						
D LAYER														
58 HYLO SPL	100.0	36.7	40	2	5	2	50	2	80	2	5	2	40	2
59 PLEU SCH	100.0	13.3	10	2	10	2	10	2	5	2	25	2	20	2
60 PTIL CRI	66.7	3.0			2	2	10	2	5	2	1	2		
61 AULA PAL	16.7	0.5			3	2								
L LAYER														
62 PELT POL	33.3	0.3							1	2			1	2
63 PELT APH	16.7	0.2					1	2						

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		WL	

SALIX/CAREX-CALAMAGROSTIS

RESOURCE INVENTORY
EDMONTON, ALBERTA
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PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V) TABLE 9 PAGE 1

PLOT NUMBER	AVERAGE VALUE		SK W037	
NUMBER OF SPECIES PER PLOT	23.0		23	
SPECIES	%P	MC	%C	SV
B1 LAYER				
1 SALI BEB	100.0	60.0	60	2
2 SALI PET	100.0	5.0	5	2
3 SALI PLA	100.0	5.0	5	2
B2 LAYER				
4 BETU PAP	100.0	1.0	1	2
5 CORN STO	100.0	1.0	1	2
6 LONI INV	100.0	1.0	1	2
7 SHEP CAN	100.0	1.0	1	2
C LAYER				
8 TRIF HYB	100.0	5.0	5	2
9 VICI AME	100.0	2.0	2	2
10 ASTE HES	100.0	1.0	1	2
11 CICU MAC	100.0	1.0	1	2
12 EQUI ARV	100.0	1.0	1	2
13 GEUM SPP	100.0	1.0	1	2
14 PYRO ASA	100.0	1.0	1	2
15 RUME SPP	100.0	1.0	1	2
16 TARA OFF	100.0	1.0	1	2
G LAYER				
17 CARE ATH	100.0	15.0	15	2
18 CALA CAN	100.0	2.0	2	2
19 JUNC BAL	100.0	2.0	2	2
20 JUNC VAS	100.0	1.0	1	2
21 POA PAL	100.0	1.0	1	2
D LAYER				
22 AULA PAL	100.0	1.0	1	2
23 BRAC SAL	100.0	1.0	1	2

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		Lt	

LARIX LARICINA/CAREX AQUATILIS

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		SK WOST	
NUMBER OF SPECIES PER PLOT	48.0		48	
SPECIES	%P	MC	%C	SV
A1 LAYER				
1 LARI LAR	100.0	10.0	10	2
A2 LAYER				
LARI LAR	100.0	30.0	30	2
2 BETU PAP	100.0	5.0	5	2
3 PICE GLA	100.0	1.0	1	1
4 PICE MAR	100.0	1.0	1	2
E LAYER				
5 PARM SUL	100.0	10.0	10	
6 USNE SOR	100.0	10.0	10	
7 CETR HAL	100.0	5.0	5	
8 CETR PIN	100.0	5.0	5	
9 EVER MES	100.0	5.0	5	
10 HYPO PHY	100.0	5.0	5	
11 PARM FLA	100.0	5.0	5	
B1 LAYER				
LARI LAR	100.0	3.0	3	2
B2 LAYER				
12 LEDU GRO	100.0	5.0	5	2
13 SALI MYR	100.0	2.0	2	2
14 ALNU TEN	100.0	1.0	1	2
15 BETU PUM	100.0	1.0	1	2
16 CORN STO	100.0	1.0	1	2
LARI LAR	100.0	1.0	1	2
C LAYER				
17 CALT PAL	100.0	10.0	10	2
18 POTE PAL	100.0	5.0	5	2
19 RUME CRI	100.0	2.0	2	2
20 ASTE PUN	100.0	1.0	1	2
21 CICU MAC	100.0	1.0	1	2
22 GALI TRF	100.0	1.0	1	2
23 LINN BOR	100.0	1.0	1	2
24 MITE NUD	100.0	1.0	1	2
25 ORTH SEC	100.0	1.0	1	2
26 PYRO ASA	100.0	1.0	1	2
27 PYRO CHL	100.0	1.0	1	2
28 RUBU ARC	100.0	1.0	1	2
29 SMIL TRI	100.0	1.0	1	2
30 STEL LON	100.0	1.0	1	2
31 VACC VIT	100.0	1.0	1	2
G LAYER				
32 CARE AQU	100.0	80.0	80	2
33 CALA CAN	100.0	1.0	1	2
34 CARE GYN	100.0	1.0	1	2
35 CARE LEP	100.0	1.0	1	2
36 CARE PAU	100.0	1.0	1	2
D LAYER				
37 DREP ADU	100.0	50.0	50	2

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		Lt	

LARIX LARICINA/CAREX AQUATILIS

RESOURCE INVENTORY
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PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO57	
NUMBER OF SPECIES PER PLOT	48.0		48	
SPECIES	%P	MC	%C	SV
38 PLAG ELL	100.0	2.0	2	2
39 AULA PAL	100.0	1.0	1	2
40 HYPN PRA	100.0	1.0	1	2
41 PLEU SCH	100.0	1.0	1	2
42 PTIL CRI	100.0	1.0	1	2
43 SPHA RUS	100.0	1.0	1	2
44 TOME NIT	100.0	1.0	1	2
L LAYER				
45 CLAD MIT	100.0	1.0	1	2

University of Alberta

LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		Sb	

PICEA MARIANA/LEDUM GROENLANDICUM/SPHAGNUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

RESOURCE INVENTORY
EDMONTON, ALBERTA
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TABLE 11 PAGE 1

PLOT NUMBER	AVERAGE VALUE		5K WO25		5K WO40		5K WO44	
NUMBER OF SPECIES PER PLOT	24.3		24		19		30	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV
A1 LAYER								
1 PICE MAR	66.7	3.3	5	1	5	2		
A2 LAYER								
PICE MAR	66.7	2.3	6	1			1	2
E LAYER								
2 USNE ALP	66.7	6.7	15		5			
3 CETR PIN	66.7	2.0			5		1	
4 HYPO PHY	66.7	2.0			5		1	
5 CETR HAL	33.3	1.7			5			
6 PARM SUL	33.3	1.7			5			
B1 LAYER								
PICE MAR	100.0	11.0	20	1	10	2	3	2
B2 LAYER								
7 LEDU GRO	100.0	60.0	60	2	80	2	40	2
PICE MAR	100.0	17.3	30	1	10	2	12	2
8 SALI PLA	33.3	3.3					10	2
9 BETU PAP	33.3	0.3					1	2
10 LARI LAR	33.3	0.3			1	1		
11 POPU TRE	33.3	0.3					1	2
C LAYER								
12 RUBU CHA	100.0	7.0	10	2	10	2	1	2
13 VACC VIT	100.0	2.7	2	2	2	2	4	2
14 OXYC MIC	100.0	1.0	1	2	1	2	1	2
15 SMIL TRI	33.3	1.7	5	2				
16 EMPE NIG	33.3	0.3	1	2				
17 EPIL ANG	33.3	0.3					1	2
18 HABE HYP	33.3	0.3					1	2
G LAYER								
19 CARE AQU	33.3	5.0					15	2
20 CARE SPP	33.3	0.3	1	2				
D LAYER								
21 DICR POL	100.0	2.3	2	2	2	2	3	2
22 HYLO SPL	100.0	2.3	5	2	1	2	1	2
23 SPHA FUS	66.7	31.7	45	2			50	2
24 SPHA RUS	66.7	16.7			40	2	10	2
25 PLEU SCH	66.7	11.7	25	2	10	2		
26 POLY JUN	66.7	0.7	1	2			1	2
27 SPHA MAG	33.3	3.3	10	2				
28 TOME NIT	33.3	3.3					10	2
29 AULA PAL	33.3	1.7					5	2
30 MYLI ANO	33.3	0.7					2	2
31 PTIL CRI	33.3	0.3	1	2				
L LAYER								
32 CLAD MIT	100.0	6.7	3	2	15	2	2	2
33 CLAD COR	66.7	0.7			1	2	1	2
34 CLAD CRI	66.7	0.7	1	2			1	2
35 PELT APH	33.3	1.0					3	2
36 CLAD RAN	33.3	0.7	2	2				

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT		Sb	

PICEA MARIANA/LEDUM GROENLANDICUM/SPHAGNUM

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

PLOT NUMBER	AVERAGE VALUE		5K WO25		5K WO40		5K WO44	
NUMBER OF SPECIES PER PLOT	24.3		24		19		30	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV
37 CLAD GRA	33.3	0.3					1	2
38 CLAD SPP	33.3	0.3					1	2
39 ICMA ERI	33.3	0.3	1	2				
40 PELT CAN	33.3	0.3					1	2
41 PELT POL	33.3	0.3	1	2				

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT			

DISTURBED STANDS

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

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PLOT NUMBER	AVERAGE VALUE		5K WO14		5K WO20		5K WO41		5K WO42	
NUMBER OF SPECIES PER PLOT	32.0		32		28		35		33	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV
A1 LAYER										
1 POPU TRE	75.0	15.5	12	2	40	2	10	2		
2 PICE GLA	75.0	6.5	1	2			10	2	15	2
3 POPU BAL	50.0	2.0	3	2	5	2				
A2 LAYER										
POPU TRE	75.0	11.3	10				15	2	20	2
PICE GLA	75.0	4.0	3				10	2	3	2
4 BETU PAP	75.0	1.8			2	2	3	2	2	2
POPU BAL	25.0	0.5	2							
E LAYER										
5 PYLA POL	100.0	5.0	5		5		5		5	
6 EURH PUL	25.0	1.3							5	
7 PARM SUL	25.0	1.3					5			
8 USNE ALP	25.0	1.3					5			
B1 LAYER										
9 SALI BEB	50.0	1.8	2	2	5	2				
PICE GLA	50.0	0.8	1	2			2	2		
10 ALNU TEN	25.0	1.3	5	2						
POPU TRE	25.0	1.3	5	2						
POPU BAL	25.0	0.8	3	2						
B2 LAYER										
11 ROSA ACI	100.0	26.3	40	2	25	2	20	2	20	2
12 VIBU EDU	100.0	11.3	5	2	10	2	15	2	15	2
13 RUBU IDA	100.0	3.0	3	2	2	2	2	2	5	2
14 RIBE OXY	100.0	2.3	2	2	1	2	1	2	5	2
15 SYMP ALB	100.0	2.0	3	2	2	2	1	2	2	2
16 LONI INV	75.0	4.0	10	2	5	2			1	2
17 AMEL ALN	75.0	3.8	2	2	3	2			10	2
18 CORN STO	75.0	2.5	3	2			2	2	5	2
PICE GLA	75.0	0.8	1	2			1	2	1	2
POPU BAL	50.0	0.8	2	2			1	2		
19 SHEP CAN	25.0	0.8					3	2		
POPU TRE	25.0	0.5	2	2						
BETU PAP	25.0	0.3							1	2
20 LONI DIO	25.0	0.3					1	2		
C LAYER										
21 EPIL ANG	100.0	10.0	15	2	20	2	3	2	2	2
22 RUBU PUB	100.0	3.0	3	2	3	2	3	2	3	2
23 ARAL NUD	75.0	5.5	2	2			10	2	10	2
24 ASTE CON	75.0	1.0			2	2	1	2	1	2
25 FRAG VIR	75.0	0.8			1	2	1	2	1	2
26 GALI BOR	75.0	0.8			1	2	1	2	1	2
27 LATH OCH	75.0	0.8	1	2	1	2	1	2		
28 PETA PAL	75.0	0.8	1	2	1	2	1	2		
29 PYRO ASA	75.0	0.8	1	2	1	2			1	2
30 MERT PAN	50.0	1.5			5	2			1	2
31 CORN CAN	50.0	1.3					3	2	2	2
32 ASTE SPP	50.0	0.5	1	2					1	2

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LEVEL	ZONE	ASSC	TYPE
ECOSYM UNIT			

DISTURBED STANDS

PRESENCE (%P), MEAN COVER (MC), PERCENT COVER (%C), SOCIABILITY (S), VIGOR (V)

RESOURCE INVENTORY
EDMONTON, ALBERTA
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PLOT NUMBER	AVERAGE VALUE		5K WO14		5K WO20		5K WO41		5K WO42	
NUMBER OF SPECIES PER PLOT	32.0		32		28		35		33	
SPECIES	%P	MC	%C	SV	%C	SV	%C	SV	%C	SV
33 MAIA CAN	50.0	0.5					1	2	1	2
34 MITE NUD	50.0	0.5					1	2	1	2
35 VICI AME	50.0	0.5			1	2	1	2		
36 VIOL REN	50.0	0.5			1	2			1	2
37 LINN BOR	25.0	1.3							5	2
38 ACTA RUB	25.0	0.3					1	2		
39 ARNI COR	25.0	0.3			1	2				
40 ASTE CIL	25.0	0.3					1	2		
41 EQUI ARV	25.0	0.3	1	2						
42 EQUI SYL	25.0	0.3			1	2				
43 GALI TRI	25.0	0.3							1	2
44 VIOL CAN	25.0	0.3			1	2				
G LAYER										
45 CALA CAN	75.0	7.8	20	2	10	2	1	2		
46 AGRO TRA	50.0	0.5					1	2	1	2
47 ELYM INN	25.0	1.3			5	2				
48 SCHI PUR	25.0	0.3							1	2

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SUMMARY VEGETATION TABLE

RESOURCE INVENTORY

EDMONTON, ALBERTA

ECOSYSTEMATIC UNITS	A1	A2	A3	A4	A5	Pb	SwA	Sw	WL	Lt	Sb
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE										
ACHI MIL		I 0.1	I 0.2								
ACTA RUB		III 1.2	I 0.2	I 0.5	II 0.3			IV 1.0			
AGRO TRA		I 0.4	II 0.3	II 0.5			I 0.2				
ALNU CRI					III 18.8						
ALNU TEN		I 0.2		II 0.7	III 2.5			I 0.2		V 1.0	
AMEL ALN	IV 3.3	V 5.8	V 3.7	II 2.0	IV 2.0	V 3.0	II 0.8	IV 0.7			
ANEM CAN						V 1.0					
ARAL NUD	IV 13.3	III 1.6	V 15.9	IV 18.8	V 5.0	V 40.0	III 3.7	IV 1.3			
ARCT UVA	II 0.3										
ARNI COR	II 0.3							I 0.2			
ASTE CIL		I 0.3	I 0.2	II 0.3			I 0.3	I 0.2			
ASTE CON	II 0.7	V 1.5	III 1.0	II 2.7	III 0.5		III 1.0	II 1.0			
ASTE HES									V 1.0		
ASTE PUN										V 1.0	
ASTE SPP		III 0.6	III 0.5	I 0.3	II 0.3		II 0.5	I 0.2			
ASTR AME	II 0.3	I 0.2									
AULA PAL							II 0.7	I 0.5	V 1.0	V 1.0	II 1.7
BETU PAP		II 0.4	II 2.1	I 0.2			III 0.8	I 6.7	V 1.0	V 5.0	II 0.3
BETU PUM										V 1.0	
BRAC CAM	II 0.3	I 0.2	I 0.2	II 0.3	II 0.3						
BRAC SAL									V 1.0		
BRYO FUS			I 0.1								
BRYU CRE			I 0.1								
CALA CAN	IV 6.7	V 10.1	IV 2.1	V 4.2	V 20.8	V 20.0	IV 1.2	II 0.5	V 2.0	V 1.0	
CALA STR							I 0.2	I 0.2			
CALT PAL										V 10.0	
CARE AQU										V 80.0	II 5.0
CARE ATH									V 15.0		
CARE GYN										V 1.0	
CARE LEP										V 1.0	
CARE PAU										V 1.0	
CARE SPP											II 0.3
CETR HAL					II 1.3	V 5.0	I 0.8	II 1.7		V 5.0	II 1.7
CETR PIN							II 1.7			V 5.0	IV 2.0
CICU MAC									V 1.0	V 1.0	
CLAD COR											IV 0.7
CLAD CRI											IV 0.7
CLAD GRA											II 0.3
CLAD MIT										V 1.0	V 6.7
CLAD RAN											II 0.7
CLAD SPP											II 0.3
CLEM OCC					II 0.3						
CORN CAN	IV 1.0	V 3.8	V 2.4	V 8.2	II 0.3		V 6.3	V 2.8			
CORN STO	IV 1.3	III 3.2	IV 2.6	IV 5.7	III 2.0	V 10.0	V 2.3	II 0.8	V 1.0	V 1.0	
CORY COR		I 0.8			II 3.8						
DELP GLA			I 0.1		II 0.3	V 1.0		I 0.2			
DICR POL											V 2.3
DISP TRA		I 0.2	II 0.4		II 0.3			I 0.2			

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ECOSYSTEMATIC UNITS	A1	A2	A3	A4	A5	Pb	SwA	Sw	WL	Lt	Sb
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE										
DREP ADU										V 50.0	
ELYM INN	II 3.3	I 0.6	I 0.2				II 0.3	II 3.5			
EMPE NIG											II 0.3
EPIL ANG	V 4.3	IV 5.1	III 1.0	V 5.8	V 10.0	V 20.0	IV 1.7	III 0.8			II 0.3
EQUI ARV		I 0.2	II 0.3	II 0.3		V 2.0		I 1.2	V 1.0		
EQUI PRA				II 0.3	II 0.3	V 20.0					
EQUI SYL		I 0.1	II 0.3	I 0.2	II 0.3		I 0.2	IV 0.7			
EURH PUL		I 0.1	I 0.1				I 0.8				
EVER MES							I 0.8			V 5.0	
FRAG VIR	V 1.3	III 1.1	IV 0.8	IV 1.3	II 0.3		V 2.7	III 0.7			
GALI BOR	V 1.3	V 1.3	V 0.9	IV 0.7	V 1.0		V 1.2	IV 0.7			
GALI TRF										V 1.0	
GALI TRI		II 0.3	III 0.5	III 0.5	III 0.5			II 0.7			
GEUM ALE			I 0.1						V 1.0		
GEUM SPP											
GOOD REP							I 0.2	II 0.3			
HABE HYP											II 0.3
HERA LAN		I 0.2	I 0.1								
HIER UMB			I 0.1		II 0.3						
HYLO SPL	II 0.3		I 0.1	I 0.2			V 18.3	V 36.7			V 2.3
HYPN PRA										V 1.0	
HYPO PHY							V 4.2	I 0.8		V 5.0	IV 2.0
ICMA ERI											II 0.3
JUNC BAL									V 2.0		
JUNC VAS									V 1.0		
LARI LAR										V 30.0	II 0.3
LATH OCH	IV 0.7	V 1.8	V 1.2	V 1.5	III 0.5		II 0.5	V 0.8			
LEDU GRO	II 0.3	I 1.3					I 0.3			V 5.0	V 60.0
LINN BOR	V 7.0	III 1.4	IV 1.4	V 6.7	II 0.3		V 11.8	V 11.3		V 1.0	
LONI DIO	IV 1.0	IV 1.4	I 0.2	III 0.5	II 0.3		III 0.7	III 0.5			
LONI INV	II 0.3	III 4.0	IV 1.0	III 4.5	V 3.8		IV 2.0	V 2.3	V 1.0		
LYCO ANN							II 0.3	I 0.2			
MAIA CAN	V 1.0	III 0.6	IV 0.8	IV 0.7	III 0.5		III 0.7	IV 0.8			
MELI SMI				I 0.5							
MENT ARV				I 0.2							
MERT PAN	II 0.3	III 0.7	II 0.5	IV 0.7	II 3.8		III 0.8	IV 4.7			
MITE NUD		III 0.6	III 0.5	II 1.0	III 0.5		IV 1.3	IV 0.8		V 1.0	
MOEH LAT		I 0.1	I 0.1	I 0.2							
MYLI ANO											II 0.7
NEPH RES							I 0.8				
ORTH OBT		III 2.1	I 1.0		II 1.3	V 5.0	II 1.7	I 0.8			

ECOSYSTEMATIC UNITS	A1	A2	A3	A4	A5	Pb	SwA	Sw	WL	Lt	Sb
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE										
ORTH SEC	II 0.3	I 0.1	II 0.3	I 0.2			II 0.3	I 0.2		V 1.0	
ORTH SPE							I 0.8				
ORYZ ASP							I 0.3				
OXYC MIC											V 1.0
PARM FLA											
PARM HYP		I 0.4				V 5.0				V 5.0	
PARM INF			I 0.1								
PARM SUL	II 0.3	I 0.8	I 1.0	III 2.5	II 1.3	V 5.0	IV 3.3	V 5.0		V 10.0	II 1.7
PELT APH							I 0.2	I 0.2			II 1.0
PELT CAN			I 0.2								II 0.3
PELT POL								II 0.3			II 0.3
PETA PAL	II 0.3	III 1.4	II 0.4	V 1.0			IV 0.7	III 0.7			
PETA VIT		I 0.2									
PHYS ADS	IV 3.3	III 1.8	III 1.8	II 1.7	II 1.3		I 0.8				
PICE GLA	II 1.7	III 0.8	II 0.9	III 1.3	III 1.0		V 20.8	V 42.0		V 1.0	
PICE MAR										V 1.0	V 17.3
PLAG CUS			I 0.1				I 0.8				
PLAG ELL										V 2.0	
PLEU SCH							V 18.3	V 13.3		V 1.0	IV 11.7
POA PAL									V 1.0		
POA PRA			I 0.1								
POLY JUN					II 1.3						IV 0.7
POLY PIL											
POPU BAL		II 0.7	II 1.1	V 17.5	V 16.3	V 40.0	I 0.2				
POPU TRE	V 43.3	V 35.8	V 53.8	V 32.5	IV 6.3	V 5.0	V 11.7	V 1.5			II 0.3
POTE PAL										V 5.0	
PRUN VIR		I 0.3	I 0.1								
PTIL CRI							II 1.0	IV 3.0		V 1.0	II 0.3
PYLA POL	V 5.0	V 4.6	V 4.5	V 5.0	III 1.5		II 1.7	I 0.8			
PYRO ASA	IV 1.0	III 0.6	IV 0.8	IV 0.8	II 0.3		IV 0.7	III 0.5	V 1.0	V 1.0	
PYRO CHL							I 0.2	II 0.3		V 1.0	
RAMA FAR			I 0.5				I 0.8	I 0.8			
RHYT TRI							I 0.2				
RIBE GLA		I 0.1			III 0.8						
RIBE LAC		I 0.2	I 0.3	I 0.2			III 0.5	I 0.2			
RIBE OXY	IV 0.7	III 2.0	III 0.6	IV 1.2	III 3.0		IV 0.8	III 0.8			
RIBE TRI	II 0.3	II 0.6	I 0.1	III 0.5	IV 1.3		IV 0.8	V 0.8			
ROSA ACI	V 11.7	V 18.3	IV 12.4	V 12.8	V 21.3	V 5.0	V 8.5	V 8.0			
ROSA WOO		II 1.1	III 10.1								
RUBU ARC										V 1.0	
RUBU CHA											V 7.0
RUBU IDA		IV 2.2	V 3.7	IV 1.8	V 10.3	V 10.0	IV 1.0	I 0.5			
RUBU PUB	IV 2.7	V 6.0	V 2.4	V 3.7	V 2.5		V 5.3	V 3.8			
RUME CRI										V 2.0	
RUME SPP									V 1.0		
SALI BEB	II 1.7	IV 5.3	II 0.3	IV 1.5	II 1.3		I 0.3		V 60.0		
SALI GLA	II 1.3										
SALI MYR				I 0.8						V 2.0	

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ECOSYSTEMATIC UNITS	A1	A2	A3	A4	A5	Pb	SwA	Sw	WL	Lt	Sb
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE										
SALI PET									V 5.0		
SALI PLA									V 5.0		II 3.3
SALI SPP		I 0.3		I 2.5							
SCHI PUR											
SHEP CAN	V 23.3	III 2.8	III 2.2	II 3.7			V 7.7	III 0.7	V 1.0		
SMIL STE			I 0.1								
SMIL TRI											
SOLI CAN		I 0.1		I 0.2						V 1.0	II 1.7
SOLI GIG		I 0.1	I 0.1								
SPHA FUS											IV 31.7
SPHA MAG											II 3.3
SPHA RUS										V 1.0	IV 16.7
STEL LON										V 1.0	
SYMP ALB	IV 0.7	V 1.8	V 1.7	IV 0.7	IV 2.0	V 1.0	IV 0.8	III 0.7			
TARA OFF		III 0.4	II 0.3	I 0.2					V 1.0		
THAL VEN		I 0.2	I 0.1			V 1.0					
TOME NIT										V 1.0	II 3.3
TRIE BOR		I 0.1		I 0.2							
TRIF HYB									V 5.0		
URTI DIO						V 1.0					
USNE ALP							IV 4.2	V 5.0			IV 6.7
USNE SOR		I 0.1	I 0.5							V 10.0	
VACC CAE	II 0.3										
VACC VIT	II 0.3										
VIBU EDU	V 6.7	V 7.9	V 7.0	V 9.7	V 8.8		I 0.2	I 0.2		V 1.0	V 2.7
VICI AME	V 1.0	IV 0.9	IV 0.9	IV 1.0	II 0.3	V 2.0	V 6.5	V 3.7			
VIOL CAN		I 0.8	I 0.6	II 0.5	III 3.0			I 0.2	V 2.0		
VIOL REN	II 0.3	I 0.1	II 0.4	II 0.3			IV 0.7	II 0.3			
XANT FAL											
XANT POL	IV 3.3	III 1.5	III 2.3	I 0.2				I 1.7			

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ECOSYSTEMATIC UNITS		
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE	
ACHI MIL		
ACTA RUB	II 0.3	
AGRO TRA	III 0.5	
ALNU CRI		
ALNU TEN	II 1.3	
AMEL ALN	IV 3.8	
ANEM CAN		
ARAL NUD	IV 5.5	
ARCT UVA		
ARNI COR	II 0.3	
ASTE CIL	II 0.3	
ASTE CON	IV 1.0	
ASTE HES		
ASTE PUN		
ASTE SPP	III 0.5	
ASTR AME		
AULA PAL		
BETU PAP	IV 1.8	
BETU PUM		
BRAC CAM		
BRAC SAL		
BRYO FUS		
BRYU CRE		
CALA CAN	IV 7.8	
CALA STR		
CALT PAL		
CARE AQU		
CARE ATH		
CARE GYN		
CARE LEP		
CARE PAU		
CARE SPP		
CETR HAL		
CETR PIN		
CICU MAC		
CLAD COR		
CLAD CRI		
CLAD GRA		
CLAD MIT		
CLAD RAN		
CLAD SPP		
CLEM OCC		
CORN CAN	III 1.3	
CORN STO	IV 2.5	
CORY COR		
DELP GLA		
DICR POL		
DISP TRA		

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EDMONTON, ALBERTA

ECOSYSTEMATIC UNITS		
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE	
DREP ADU		
ELYM INN	II 1.3	
EMPE NIG		
EPIL ANG	V 10.0	
EQUI ARV	II 0.3	
EQUI PRA		
EQUI SYL	II 0.3	
EURH PUL	II 1.3	
EVER MES		
FRAG VIR	IV 0.8	
GALI BOR	IV 0.8	
GALI TRF		
GALI TRI	II 0.3	
GEUM ALE		
GEUM SPP		
GOOD REP		
HABE HYP		
HERA LAN		
HIER UMB		
HYLO SPL		
HYPN PRA		
HYPO PHY		
ICMA ERI		
JUNC BAL		
JUNC VAS		
LARI LAR		
LATH OCH	IV 0.8	
LEDU GRO		
LINN BOR	II 1.3	
LONI DIO	II 0.3	
LONI INV	IV 4.0	
LYCO ANN		
MAIA CAN	III 0.5	
MELI SMI		
MENT ARV		
MERT PAN	III 1.5	
MITE NUD	III 0.5	
MOEH LAT		
MYLI ANO		
NEPH RES		
ORTH OBT		

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EDMONTON, ALBERTA

ECOSYSTEMATIC UNITS		
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE	
ORTH SEC		
ORTH SPE		
ORYZ ASP		
OXYC MIC		
PARM FLA		
PARM HYP		
PARM INF		
PARM SUL	II 1.3	
PELT APH		
PELT CAN		
PELT POL		
PETA PAL	IV 0.8	
PETA VIT		
PHYS ADS		
PICE GLA	IV 6.5	
PICE MAR		
PLAG CUS		
PLAG ELL		
PLEU SCH		
POA PAL		
POA PRA		
POLY JUN		
POLY PIL		
POPU BAL	III 2.0	
POPU TRE	IV 15.5	
POTE PAL		
PRUN VIR		
PTIL CRI		
PYLA POL	V 5.0	
PYRO ASA	IV 0.8	
PYRO CHL		
RAMA FAR		
RHYT TRI		
RIBE GLA		
RIBE LAC		
RIBE OXY	V 2.3	
RIBE TRI		
ROSA ACI	V 26.3	
ROSA WOO		
RUBU ARC		
RUBU CHA		
RUBU IDA	V 3.0	
RUBU PUB	V 3.0	
RUME CRI		
RUME SPP		
SALI BEB	III 1.8	
SALI GLA		
SALI MYR		

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EDMONTON, ALBERTA

ECOSYSTEMATIC UNITS		
SPECIES	PRESENCE CLASS AND MEAN SPECIES SIGNIFICANCE	
SALI PET		
SALI PLA		
SALI SPP		
SCHI PUR	II 0.3	
SHEP CAN	II 0.8	
SMIL STE		
SMIL TRI		
SOLI CAN		
SOLI GIG		
SPHA FUS		
SPHA MAG		
SPHA RUS		
STEL LON		
SYMP ALB	V 2.0	
TARA OFF		
THAL VEN		
TOME NIT		
TRIE BOR		
TRIF HYB		
URTI DIO		
USNE ALP	II 1.3	
USNE SOR		
VACC CAE		
VACC VIT		
VIBU EDU	V 11.3	
VICI AME	III 0.5	
VIOL CAN	II 0.3	
VIOL REN	III 0.5	
XANT FAL		
XANT POL		

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VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA A			
BETUPAP	Betula papyrifera Marsh.	BETULACEAE	White Birch (EHM)
LARILAR	Larix laricina (Du Roi) K. Koch	PINACEAE	Tamarack (EHM)
PICEGLA	Picea glauca (Moench) Voss	PINACEAE	White Spruce (EHM)
PICEMAR	Picea mariana (Mill.) BSP.	PINACEAE	Black Spruce (EHM)
POPUBAL	Populus balsamifera L.	SALICACEAE	Balsam Poplar (EHM)
POPUTRE	Populus tremuloides Michx.	SALICACEAE	Aspen (EHM)
BETUPAP	Betula papyrifera Marsh.	BETULACEAE	White Birch (EHM)
LARILAR	Larix laricina (Du Roi) K. Koch	PINACEAE	Tamarack (EHM)
PICEGLA	Picea glauca (Moench) Voss	PINACEAE	White Spruce (EHM)
PICEMAR	Picea mariana (Mill.) BSP.	PINACEAE	Black Spruce (EHM)
POPUBAL	Populus balsamifera L.	SALICACEAE	Balsam Poplar (EHM)
POPUTRE	Populus tremuloides Michx.	SALICACEAE	Aspen (EHM)
STRATA B			
ALNUCRI	Alnus crispa (Ait.) Pursh	BETULACEAE	Green Alder (EHM)
ALNUTEN	Alnus tenuifolia Nutt.	BETULACEAE	River Alder (EHM)
AMELALN	Amelanchier alnifolia Nutt.	ROSACEAE	Saskatoon (EHM)
BETUPUM	Betula pumila L.	BETULACEAE	Dwarf Birch (EHM)
CORNSTO	Cornus stolonifera Michx.	CORNACEAE	Red Osier Dogwood (EHM)
CORYCOR	Corylus cornuta Marsh.	BETULACEAE	Beaked Hazelnut (EHM)
LEDUGRO	Ledum groenlandicum Oeder	ERICACEAE	Common Labrador Tea (EHM)
LONIDIO	Lonicera dioica L.	CAPRIFOLIACEAE	Twining Honeysuckle (EHM)
LONIINV	Lonicera involucrata (Richards.) Banks	CAPRIFOLIACEAE	Bracted Honeysuckle (EHM)
PRUNVIR	Prunus virginiana L.	ROSACEAE	Choke Cherry (EHM)
RIBEGLA	Ribes glandulosum Grauer	GROSSULARIACEAE	Skunk Currant (EHM)
RIBELAC	Ribes lacustre (Pers.) Poir.	GROSSULARIACEAE	Bristly Black Currant (EHM)
RIBEOXY	Ribes oxyacanthoides L.	GROSSULARIACEAE	Wild Gooseberry (EHM)
RIBETRI	Ribes triste Pall.	GROSSULARIACEAE	Wild Red Currant (EHM)
ROSAACI	Rosa acicularis Lindl.	ROSACEAE	Prickly Rose (EHM)
ROSAWOO	Rosa woodsii Lindl.	ROSACEAE	Common Wild Rose (EHM)
RUBUIDA	Rubus idaeus L.	ROSACEAE	Wild Red Raspberry (EHM)
SALIBEB	Salix bebbiana Sarg.	SALICACEAE	Beaked Willow (ACB)
SALIGLA	Salix glauca L.	SALICACEAE	Smooth Willow (ACB)
SALIMYR	Salix myrtillifolia Anderss.	SALICACEAE	Myrtle-leaved Willow (ACB)
SALIPET	Salix petiolaris J.E. Smith	SALICACEAE	Basket Willow (ACB)
SALIPLA	Salix planifolia Pursh	SALICACEAE	Flat-leaved Willow (ACB)
SHEPCAN	Shepherdia canadensis (L.) Nutt.	ELAEAGNACEAE	Canadian Buffalo-berry (EHM)
SYMPALB	Symphoricarpos albus (L.) Blake	CAPRIFOLIACEAE	Snowberry (EHM)
VIBUEDU	Viburnum edule (Michx.) Raf.	CAPRIFOLIACEAE	Low-bush Cranberry (EHM)
ALNUCRI	Alnus crispa (Ait.) Pursh	BETULACEAE	Green Alder (EHM)

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VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA B			
ALNUTEN	Alnus tenuifolia Nutt.	BETULACEAE	River Alder (EHM)
AMELALN	Amelanchier alnifolia Nutt.	ROSACEAE	Saskatoon (EHM)
BETUPUM	Betula pumila L.	BETULACEAE	Dwarf Birch (EHM)
CORNSTO	Cornus stolonifera Michx.	CORNACEAE	Red Osier Dogwood (EHM)
CORYCOR	Corylus cornuta Marsh.	BETULACEAE	Beaked Hazelnut (EHM)
LEDUGRO	Ledum groenlandicum Oeder	ERICACEAE	Common Labrador Tea (EHM)
LONIDIO	Lonicera dioica L.	CAPRIFOLIACEAE	Twining Honeysuckle (EHM)
LONIINV	Lonicera involucrata (Richards.) Banks	CAPRIFOLIACEAE	Bracted Honeysuckle (EHM)
PRUNVIR	Prunus virginiana L.	ROSACEAE	Choke Cherry (EHM)
RIBEGLA	Ribes glandulosum Grauer	GROSSULARIACEAE	Skunk Currant (EHM)
RIBELAC	Ribes lacustre (Pers.) Poir.	GROSSULARIACEAE	Bristly Black Currant (EHM)
RIBEOXY	Ribes oxyacanthoides L.	GROSSULARIACEAE	Wild Gooseberry (EHM)
RIBETRI	Ribes triste Pall.	GROSSULARIACEAE	Wild Red Currant (EHM)
ROSAACI	Rosa acicularis Lindl.	ROSACEAE	Prickly Rose (EHM)
ROSAWOO	Rosa woodsii Lindl.	ROSACEAE	Common Wild Rose (EHM)
RUBUIDA	Rubus idaeus L.	ROSACEAE	Wild Red Raspberry (EHM)
SALIBEB	Salix bebbiana Sarg.	SALICACEAE	Beaked Willow (ACB)
SALIGLA	Salix glauca L.	SALICACEAE	Smooth Willow (ACB)
SALIMYR	Salix myrtillifolia Anderss.	SALICACEAE	Myrtle-leaved Willow (ACB)
SALIPET	Salix petiolaris J.E. Smith	SALICACEAE	Basket Willow (ACB)
SALIPLA	Salix planifolia Pursh	SALICACEAE	Flat-leaved Willow (ACB)
SHEPCAN	Shepherdia canadensis (L.) Nutt.	ELAEAGNACEAE	Canadian Buffalo-berry (EHM)
SYMPALB	Symphoricarpos albus (L.) Blake	CAPRIFOLIACEAE	Snowberry (EHM)
VIBUEDU	Viburnum edule (Michx.) Raf.	CAPRIFOLIACEAE	Low-bush Cranberry (EHM)
STRATA C			
ACHIMIL	Achillea millefolium L.	COMPOSITAE	Common Yarrow (EHM)
ACTARUB	Actaea rubra (Ait.) Willd.	RANUNCULACEAE	Red and White Baneberry (EHM)
ANEMCAN	Anemone canadensis L.	RANUNCULACEAE	Canada Anenome (EHM)
ARALNUD	Aralia nudicaulis L.	ARALIACEAE	Wild Sarsaparilla (EHM)
ARCTUVA	Arctostaphylos uva-ursi (L.) Spreng.	ERICACEAE	Common Bearberry (EHM)
ARNICOR	Arnica cordifolia Hook.	COMPOSITAE	Heart-leaved Arnica (ACB)
ASTECIL	Aster ciliolatus Lindl.	COMPOSITAE	Lindley's Aster (EHM)
ASTECON	Aster conspicuus Lindl.	COMPOSITAE	Showy Aster (EHM)
ASTEHES	Aster hesperius A. Gray	COMPOSITAE	Western Willow Aster (EHM)
ASTEPUN	Aster puniceus L.	COMPOSITAE	Purple-stemmed Aster (EHM)
ASTRAME	Astragalus americanus (Hook.) M.E. Jones	LEGUMINOSAE	American Milk Vetch (ACB)
CALTPAL	Caltha palustris L	RANUNCULACEAE	Marsh Marigold (EHM)
CICUMAC	Cicuta maculata L.	UMBELLIFERAE	Water Hemlock (ACB)
CLEMOCC	Clematis occidentalis (Hornem.) DC.	RANUNCULACEAE	Purple Clematis (EHM)
CORNCAN	Cornus canadensis L.	CORNACEAE	Bunchberry (EHM)
DELPGLA	Delphinium glaucum S. Wats.	RANUNCULACEAE	Tall Larkspur (EHM)
DISPTRA	Disporum trachycarpum (S. Wats.) B. & H.	LILIACEAE	Fairybells (ACB)

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VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA C			
EMPENIG	Empetrum nigrum L.	EMPETRACEAE	Crowberry (EHM)
EPILANG	Epilobium angustifolium L.	ONAGRACEAE	Fireweed (EHM)
EQUIARV	Equisetum arvense L.	EQUISETACEAE	Common Horsetail (EHM)
EQUIPRA	Equisetum pratense Ehrh.	EQUISETACEAE	Meadow Horsetail (ACB)
EQUISYL	Equisetum sylvaticum L.	EQUISETACEAE	Woodland Horsetail (EHM)
FRAGVIR	Fragaria virginiana Duchesne	ROSACEAE	Wild Strawberry (EHM)
GALIBOR	Galium boreale L.	RUBIACEAE	Northern Bedstraw (EHM)
GALITRF	Galium trifidum L.	RUBIACEAE	Small Bedstraw (EHM)
GALITRI	Galium triflorum Michx.	RUBIACEAE	Sweet-scented Bedstraw (EHM)
GEUMALE	Geum aleppicum Jacq.	ROSACEAE	Yellow Avens (EHM)
GOODREP	Goodyera repens (L.) R.Br.	ORCHIDACEAE	Lesser Rattlesnake Plantain (ACB)
HABEHYP	Habenaria hyperborea (L.) R.Br.	ORCHIDACEAE	Northern Green Orchid (EHM)
HERALAN	Heracleum lanatum Michx.	UMBELLIFERAE	Cow Parsnip (EHM)
HIERUMB	Hieracium umbellatum L.	COMPOSITAE	Narrow-leaved Hawkweed (EHM)
LATHOCH	Lathyrus ochroleucus Hook.	LEGUMINOSAE	Cream-colored Vetchling (ACB)
LINNBOR	Linnaea borealis L.	CAPRIFOLIACEAE	Twin-flower (EHM)
LYCOANN	Lycopodium annotinium L.	LYCOPODIACEAE	Stiff Club-moss (EHM)
MAIACAN	Maianthemum canadense Desf.	LILACEAE	Wild Lily-of-the-valley (EHM)
MENTARV	Mentha arvensis L.	LABIATAE	Wild Mint (EHM)
MERTPAN	Mertensia paniculata (Ait.) G. Don.	BORAGINACEAE	Tall Mertensia (EHM)
MITENUD	Mitella nuda L.	SAXIFRAGACEAE	Bishop's Cap (EHM)
MOEHLAT	Moehringia lateriflora (L.) Fenzl.	CARYOPHYLLACEAE	Blunt-leaved Sandwort (ACB)
ORTHSEC	Orthilia secunda (L.) House	PYROLACEAE	One-sided Wintergreen (EHM)
OXYCMIC	Oxycoccus microcarpus Turcz.	ERICACEAE	Small Bog Cranberry (EHM)
PETAPAL	Petasites palmatus (Ait.) A. Gray	COMPOSITAE	Palmate-leaved Coltsfoot (EHM)
PETAVIT	Petasites vitifolius Greene	COMPOSITAE	Vine-leaved Coltsfoot (ACB)
POTEPAL	Potentilla palustris (L.) Scop.	ROSACEAE	Marsh Cinquefoil (EHM)
PYROASA	Pyrola asarifolia Michx.	PYROLACEAE	Common Pink Wintergreen (EHM)
PYROCHL	Pyrola chlorantha Sw.	PYROLACEAE	Greenish-flowered Wintergreen (EHM)
RUBUARC	Rubus arcticus L.	ROSACEAE	Dwarf Raspberry (EHM)
RUBUCHA	Rubus chamaemorus L.	ROSACEAE	Cloudberry (EHM)
RUBUPUB	Rubus pubescens Raf.	ROSACEAE	Dewberry (EHM)
RUMECRI	Rumex crispus L.	POLYGONACEAE	Curled Dock (EHM)
SMILSTE	Smilacina stellata (L.) Desf.	LILIACEAE	Star-flowered Solomon's-seal (EHM)
SMILTRI	Smilacina trifolia (L.) Desf.	LILIACEAE	Three-leaved Solomon's-seal (EHM)
SOLICAN	Solidago canadensis L.	COMPOSITAE	Canada Goldenrod (EHM)
SOLIGIG	Solidago gigantea Ait.	COMPOSITAE	Late Goldenrod (ACB)
STELLON	Stellaria longifolia Muhl.	CARYOPHYLLACEAE	Long-leaved Chickweed (EHM)
TARAOFF	Taraxacum officinale Weber	COMPOSITAE	Common Dandelion (EHM)
THALVEN	Thalictrum venulosum Trel.	RANUNCULACEAE	Veiny Meadow Rue (EHM)
TRIEBOR	Trientalis borealis Raf.	PRIMULACEAE	Northern Starflower (ACB)
TRIFHYB	Trifolium hybridum L.	LEGUMINOSAE	Alsike Clover (EHM)
URTIDIO	Urtica dioica L.	URTICACEAE	Common Nettle (EHM)
VACCCAE	Vaccininum caespitosum Michx.	ERICACEAE	Dwarf Bilberry (EHM)

VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA C			
VACCVIT	Vaccininum vitis-idaea L.	ERICACEAE	Bog Cranberry (EHM)
VICIAME	Vicia americana Muhl.	LEGUMINOSAE	Wild Vetch (EHM)
VIOLCAN	Viola canadensis L.	VIOLACEAE	Western Canada Violet (EHM)
VIOLREN	Viola renifolia A. Gray	VIOLACEAE	Kidney-leaved Violet (EHM)
ACHIMIL	Achillea millefolium L.	COMPOSITAE	Common Yarrow (EHM)
ACTARUB	Actaea rubra (Ait.) Willd.	RANUNCULACEAE	Red and White Baneberry (EHM)
ANEMCAN	Anemone canadensis L.	RANUNCULACEAE	Canada Anenome (EHM)
ARALNUD	Aralia nudicaulis L.	ARALIACEAE	Wild Sarsaparilla (EHM)
ARCTUVA	Arctostaphylos uva-ursi (L.) Spreng.	ERICACEAE	Common Bearberry (EHM)
ARNICOR	Arnica cordifolia Hook.	COMPOSITAE	Heart-leaved Arnica (ACB)
ASTECIL	Aster ciliolatus Lindl.	COMPOSITAE	Lindley's Aster (EHM)
ASTECON	Aster conspicuus Lindl.	COMPOSITAE	Showy Aster (EHM)
ASTEHES	Aster hesperius A. Gray	COMPOSITAE	Western Willow Aster (EHM)
ASTEPUN	Aster puniceus L.	COMPOSITAE	Purple-stemmed Aster (EHM)
ASTRAME	Astragalus americanus (Hook.) M.E. Jones	LEGUMINOSAE	American Milk Vetch (ACB)
CALTPAL	Caltha palustris L	RANUNCULACEAE	Marsh Marigold (EHM)
CICUMAC	Cicuta maculata L.	UMBELLIFERAE	Water Hemlock (ACB)
CLEMOCC	Clematis occidentalis (Hornem.) DC.	RANUNCULACEAE	Purple Clematis (EHM)
CORNCAN	Cornus canadensis L.	CORNACEAE	Bunchberry (EHM)
DELPGLA	Delphinium glaucum S. Wats.	RANUNCULACEAE	Tall Larkspur (EHM)
DISPTRA	Disporum trachycarpum (S. Wats.) B. & H.	LILIACEAE	Fairybells (ACB)
EMPENIG	Empetrum nigrum L.	EMPETRACEAE	Crowberry (EHM)
EPILANG	Epilobium angustifolium L.	ONAGRACEAE	Fireweed (EHM)
EQUIARV	Equisetum arvense L.	EQUISETACEAE	Common Horsetail (EHM)
EQUIPRA	Equisetum pratense Ehrh.	EQUISETACEAE	Meadow Horsetail (ACB)
EQUISYL	Equisetum sylvaticum L.	EQUISETACEAE	Woodland Horsetail (EHM)
FRAGVIR	Fragaria virginiana Duchesne	ROSACEAE	Wild Strawberry (EHM)
GALIBOR	Galium boreale L.	RUBIACEAE	Northern Bedstraw (EHM)
GALITRF	Galium trifidum L.	RUBIACEAE	Small Bedstraw (EHM)
GALITRI	Galium triflorum Michx.	RUBIACEAE	Sweet-scented Bedstraw (EHM)
GEUMALE	Geum aleppicum Jacq.	ROSACEAE	Yellow Avens (EHM)
GOODREP	Goodyera repens (L.) R.Br.	ORCHIDACEAE	Lesser Rattlesnake Plantain (ACB)
HABEHYP	Habenaria hyperborea (L.) R.Br.	ORCHIDACEAE	Northern Green Orchid (EHM)
HERALAN	Heracleum lanatum Michx.	UMBELLIFERAE	Cow Parsnip (EHM)
HIERUMB	Hieracium umbellatum L.	COMPOSITAE	Narrow-leaved Hawkweed (EHM)
LATHOCH	Lathyrus ochroleucus Hook.	LEGUMINOSAE	Cream-colored Vetchling (ACB)
LINNBOR	Linnaea borealis L.	CAPRIFOLIACEAE	Twin-flower (EHM)
LYCOANN	Lycopodium annotinium L.	LYCOPODIACEAE	Stiff Club-moss (EHM)
MAIACAN	Maianthemum canadense Desf.	LILACEAE	Wild Lily-of-the-valley (EHM)
MENTARV	Mentha arvensis L.	LABIATAE	Wild Mint (EHM)
MERTPAN	Mertensia paniculata (Ait.) G. Don.	BORAGINACEAE	Tall Mertensia (EHM)
MITENUD	Mitella nuda L.	SAXIFRAGACEAE	Bishop's Cap (EHM)
MOEHLAT	Moehringia lateriflora (L.) Fenzl.	CARYOPHYLLACEAE	Blunt-leaved Sandwort (ACB)
ORTHSEC	Orthilia secunda (L.) House	PYROLACEAE	One-sided Wintergreen (EHM)

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VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA C			
OXYCMIC	Oxycoccus microcarpus Turcz.	ERICACEAE	Small Bog Cranberry (EHM)
PETAPAL	Petasites palmatus (Ait.) A. Gray	COMPOSITAE	Palmate-leaved Coltsfoot (EHM)
PETAVIT	Petasites vitifolius Greene	COMPOSITAE	Vine-leaved Coltsfoot (ACB)
POTEPAL	Potentilla palustris (L.) Scop.	ROSACEAE	Marsh [illegible]nquefoil (EHM)
PYROASA	Pyrola asarifolia Michx.	PYROLACEAE	Common Pink Wintergreen (EHM)
PYROCHL	Pyrola chlorantha Sw.	PYROLACEAE	Greenish-flowered Wintergreen (EHM)
RUBUARC	Rubus arcticus L.	ROSACEAE	Dwarf Raspberry (EHM)
RUBUCHA	Rubus chamaemorus L.	ROSACEAE	Cloudberry (EHM)
RUBUPUB	Rubus pubescens Raf.	ROSACEAE	Dewberry (EHM)
RUMECRI	Rumex crispus L.	POLYGONACEAE	Curled Dock (EHM)
SMILSTE	Smilacina stellata (L.) Desf.	LILIACEAE	Star-flowered Solomon's-seal (EHM)
SMILTRI	Smilacina trifolia (L.) Desf.	LILIACEAE	Three-leaved Solomon's-seal (EHM)
SOLICAN	Solidago canadensis L.	COMPOSITAE	Canada Goldenrod (EHM)
SOLIGIG	Solidago gigantea Ait.	COMPOSITAE	Late Goldenrod (ACB)
STELLON	Stellaria longifolia Muhl.	CARYOPHYLLACEAE	Long-leaved Chickweed (EHM)
TARAOFF	Taraxacum officinale Weber	COMPOSITAE	Common Dandelion (EHM)
THALVEN	Thalictrum venulosum Trel.	RANUNCULACEAE	Veiny Meadow Rue (EHM)
TRIEBOR	Trientalis borealis Raf.	PRIMULACEAE	Northern Starflower (ACB)
TRIFHYB	Trifolium hybridum L.	LEGUMINOSAE	Alsike Clover (EHM)
URTIDIO	Urtica dioica L.	URTICACEAE	Common Nettle (EHM)
VACCCAE	Vaccininum caespitosum Michx.	ERICACEAE	Dwarf Bilberry (EHM)
VACCVIT	Vaccininum vitis-idaea L.	ERICACEAE	Bog Cranberry (EHM)
VICIAME	Vicia americana Muhl.	LEGUMINOSAE	Wild Vetch (EHM)
VIOLCAN	Viola canadensis L.	VIOLACEAE	Western Canada Violet (EHM)
VIOLREN	Viola renifolia A. Gray	VIOLACEAE	Kidney-leaved Violet (EHM)
STRATA D			
AULAPAL	Aulacomnium palustre (Hedw.)Schwaegr.	AULACOMNIACEAE	Tufted Moss
BRACCAM	Brachythecium campestre (C. Mull.)B.S.G.	BRACHYTHECIACEAE	Brachythecium Moss
BRACSAL	Brachythecium salebrosum (Web. and Mohr)B.S.G.	BRACHYTHECIACEAE	Brachythecium Moss
BRYUCRE	Bryum creberrimum Tayl.	BRYACEAE	Bryum Moss
DICRPOL	Dicranum polysetum Sw.	DICRANACEAE	Cushion Moss
DREPADU	Drepanocladus aduncus (Hedw.)Warnst.	AMBLYSTEGIACEAE	Brown Moss
EURHPUL	Eurhynchium pulchellum (Hedw.)Jenn.	BRACHYTHECIACEAE	
HYLOSPL	Hylocomium splendens (Hedw.)B.S.G.	HYLOCOMIACEAE	Stair-step Moss
HYPNPRA	Hypnum pratense Koch ex Brid.	HYPNACEAE	
MYLIANO	Mylia anomala (Hook.) S. Gray	JUNGERMANNIACEAE	Liverwort
ORTHOBT	Orthotrichum obtusifolium Brid.	ORTHOTRICHACEAE	
ORTHSPE	Orthotrichum speciosum Nees ex Sturm	ORTHOTRICHACEAE	
PLAGCUS	Plagiomnium cuspidatum (Hedw.)Kop.	MNIACEAE	Mnium Moss
PLAGELL	Plagiomnium ellipticum (Brid.)Kop.	MNIACEAE	Mnium Moss
PLEUSCH	Pleurozium schreberi (Brid.)Mitt.	ENTODONTACEAE	Schreber's Moss
POLYJUN	Polytrichum juniperinum Hedw.	POLYTRICHACEAE	Hair Cap Moss

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VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA D			
POLYPIL	Polytrichum piliferum Hedw.	POLYTRICHACEAE	Hair Cap Moss
PTILCRI	Ptilium crista-castrensis (Hedw.)De Not.	HYPNACEAE	Knight's Plume Moss
PYLAPOL	Pylaisiella polyantha (Hedw.)Grout	HYPNACEAE	
RHYTTRI	Rhytidiadelphus triquetrus (Hedw.)Warnst.	RHYTIDIACEAE	Red-stemmed Pipecleaner Moss
SPHAFUS	Sphagnum fuscum (Schimp.)Klinggr.	SPHAGNACEAE	Peat Moss
SPHAMAG	Sphagnum magellanicum Brid.	SPHAGNACEAE	Peat Moss
SPHARUS	Sphagnum russowii Warnst.	SPHAGNACEAE	Peat Moss
TOMENIT	Tomenthypnum nitens (Hedw.)Loeske	BRACHYTHECIACEAE	Golden Moss
AULAPAL	Aulacomnium palustre (Hedw.)Schwaegr.	AULACOMNIACEAE	Tufted Moss
BRACCAM	Brachythecium campestre (C. Mull.)B.S.G.	BRACHYTHECIACEAE	Brachythecium Moss
BRACSAL	Brachythecium salebrosum (Web. and Mohr)B.S.G.	BRACHYTHECIACEAE	Brachythecium Moss
BRYUCRE	Bryum creberrimum Tayl.	BRYACEAE	Bryum Moss
DICRPOL	Dicranum polysetum Sw.	DICRANACEAE	Cushion Moss
DREPADU	Drepanocladus aduncus (Hedw.)Warnst.	AMBLYSTEGIACEAE	Brown Moss
EURHPUL	Eurhynchium pulchellum (Hedw.)Jenn.	BRACHYTHECIACEAE	
HYLOSPL	Hylocomium splendens (Hedw.)B.S.G.	HYLOCOMIACEAE	Stair-step Moss
HYPNPRA	Hypnum pratense Koch ex Brid.	HYPNACEAE	
MYLIANO	Mylia anomala (Hook.) S. Gray	JUNGERMANNIACEAE	Liverwort
ORTHOBT	Orthotrichum obtusifolium Brid.	ORTHOTRICHACEAE	
ORTHSPE	Orthotrichum speciosum Nees ex Sturm	ORTHOTRICHACEAE	
PLAGCUS	Plagiomnium cuspidatum (Hedw.)Kop.	MNIACEAE	Mnium Moss
PLAGELL	Plagiomnium ellipticum (Brid.)Kop.	MNIACEAE	Mnium Moss
PLEUSCH	Pleurozium schreberi (Brid.)Mitt.	ENTODONTACEAE	Schreber's Moss
POLYJUN	Polytrichum juniperinum Hedw.	POLYTRICHACEAE	Hair Cap Moss
POLYPIL	Polytrichum piliferum Hedw.	POLYTRICHACEAE	Hair Cap Moss
PTILCRI	Ptilium crista-castrensis (Hedw.)De Not.	HYPNACEAE	Knight's Plume Moss
PYLAPOL	Pylaisiella polyantha (Hedw.)Grout	HYPNACEAE	
RHYTTRI	Rhytidiadelphus triquetrus (Hedw.)Warnst.	RHYTIDIACEAE	Red-stemmed Pipecleaner Moss
SPHAFUS	Sphagnum fuscum (Schimp.)Klinggr.	SPHAGNACEAE	Peat Moss
SPHAMAG	Sphagnum magellanicum Brid.	SPHAGNACEAE	Peat Moss
SPHARUS	Sphagnum russowii Warnst.	SPHAGNACEAE	Peat Moss
TOMENIT	Tomenthypnum nitens (Hedw.)Loeske	BRACHYTHECIACEAE	Golden Moss
STRATA G			
AGROTRA	Agropyron trachycaulum (Link) Malte	GRAMINEAE	Slender Wheat Grass (ACB)
CALACAN	Calamagrostis canadensis (Michx.) Beauv.	GRAMINEAE	Marsh Reed Grass (EHM)
CALASTR	Calamagrostis stricta (Timm) Koeler	GRAMINEAE	Reed Grass
CAREAQU	Carex aquatilis Wahlenb.	CYPERACEAE	Water Sedge (ACB)
CAREATH	Carex atherodes Spreng.	CYPERACEAE	Awned Sedge (ACB)
CAREGYN	Carex gynocrates Wormsk.	CYPERACEAE	Northern Bog Sedge (ACB)
CARELEP	Carex leptalea Wahlenb.	CYPERACEAE	Bristle-stalked Sedge (ACB)
CAREPAU	Carex pauciflora Lightf.	CYPERACEAE	Few-flowered Sedge (ACB)
ELYMINN	Elymus innovatus Beal	GRAMINEAE	Hairy Wild Rye (EHM)

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VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA G			
JUNCBAL	Juncus balticus Willd.	JUNCACEAE	Wire Rush (EHM)
JUNCVAS	Juncus vaseyi Engelm.	JUNCACEAE	Big-head Rush (ACB)
MELISMI	Melica smithii (Porter) Vasey	GRAMINEAE	Melic Grass (EHM)
ORYZASP	Oryzopsis asperifolia Michx.	GRAMINEAE	White-grained Mountain Rice Grass (ACB)
POA PAL	Poa palustris L.	GRAMINEAE	Fowl Bluegrass (EHM)
POA PRA	Poa pratensis L.	GRAMINEAE	Kentucky Bluegrass (EHM)
SCHIPUR	Schizachne purpurascens (Torr.) Swallen	GRAMINEAE	False Medic (EHM)
AGROTRA	Agropyron trachycaulum (Link) Malte	GRAMINEAE	Slender Wheat Grass (ACB)
CALACAN	Calamagrostis canadensis (Michx.) Beauv.	GRAMINEAE	Marsh Reed Grass (EHM)
CALASTR	Calamagrostis stricta (Timm) Koeler	GRAMINEAE	Reed Grass
CAREAQU	Carex aquatilis Wahlenb.	CYPERACEAE	Water Sedge (ACB)
CAREATH	Carex atherodes Spreng.	CYPERACEAE	Awned Sedge (ACB)
CAREGYN	Carex gynocrates Wormsk.	CYPERACEAE	Northern Bog Sedge (ACB)
CARELEP	Carex leptalea Wahlenb.	CYPERACEAE	Bristle-stalked Sedge (ACB)
CAREPAU	Carex pauciflora Lightf.	CYPERACEAE	Few-flowered Sedge (ACB)
ELYMINN	Elymus innovatus Beal	GRAMINEAE	Hairy Wild Rye (EHM)
JUNCBAL	Juncus balticus Willd.	JUNCACEAE	Wire Rush (EHM)
JUNCVAS	Juncus vaseyi Engelm.	JUNCACEAE	Big-head Rush (ACB)
MELISMI	Melica smithii (Porter) Vasey	GRAMINEAE	Melic Grass (EHM)
ORYZASP	Oryzopsis asperifolia Michx.	GRAMINEAE	White-grained Mountain Rice Grass (ACB)
POA PAL	Poa palustris L.	GRAMINEAE	Fowl Bluegrass (EHM)
POA PRA	Poa pratensis L.	GRAMINEAE	Kentucky Bluegrass (EHM)
SCHIPUR	Schizachne purpurascens (Torr.) Swallen	GRAMINEAE	False Medic (EHM)
STRATA L			
BRYOFUS	Bryoria fuscescens (Gyel.) Brodo & Hawks.	USNEACEAE	Old Man's Beard
CETRHAL	Cetraria halei W.Culb. & C.Culb.	PARMELIACEAE	
CETRPIN	Cetraria pinastri (Scop.) S.Gray	PARMELIACEAE	
CLADCOR	Cladonia cornuta (L.) Hoffm.	CLADONIACEAE	Reindeer Lichen
CLADCRI	Cladonia crispata (Ach.) Flot.	CLADONIACEAE	Reindeer Lichen
CLADGRA	Cladonia gracilis (L.) Willd.	CLADONIACEAE	Reindeer Lichen
CLADMIT	Cladina mitis (Sandst.) Hale & W.Culb.	CLADONIACEAE	Reindeer Lichen
CLADRAN	Cladina rangiferina (L.) Harm.	CLADONIACEAE	Reindeer Lichen
EVERMES	Evernia mesomorpha Nyl.	USNEACEAE	
HYPOPHY	Hypogymnia physodes (L.) W. Wats	PARMELIACEAE	
ICMAERI	Icmadophila ericetorum (L.) Zahlbr.	LECANORACEAE	
NEPHRES	Nephroma resupinatum (L.) Ach.	NEPHROMATACEAE	
PARMFLA	Parmelia flaventior Stirt.	PARMELIACEAE	
PARMHYP	Parmeliopsis hyperopta (Ach.) Arn.	PARMELIACEAE	
PARMINF	Parmelia infumata Nyl.	PARMELIACEAE	
PARMSUL	Parmelia sulcata Tayl.	PARMELIACEAE	
PELTAPH	Peltigera aphthosa (L.) Willd.	PELTIGERACEAE	Studded Leather Lichen
PELTCAN	Peltigera canina (L.) Willd.	PELTIGERACEAE	Dog Lichen

VEGETATION DATA CODES ENCOUNTERED IN THE SUMMARY TABLE

CODE	LATIN NAME	FAMILY NAME	COMMON NAME
STRATA L			
PELTPOL	Peltigera polydactyla (Neck.) Hoffm.	PELTIGERACEAE	
PHYSADS	Physcia adscendens (Th. Fr.) Oliv.	PHYSCIACEAE	
RAMAFAR	Ramalina farinacea (L.) Ach., B	RAMALINACEAE	
USNEALP	Usnea alpina Mot.	USNEACEAE	Old Man's Beard
USNESOR	Usnea sorediifera (Arn.) Lynge	USNEACEAE	Old Man's Beard
XANTFAL	Xanthoria fallax (Hepp) Arn.	TELOSCHISTACEAE	
XANTPOL	Xanthoria polycarpa (Ehrh.) Oliv.	TELOSCHISTACEAE	
BRYOFUS	Bryoria fuscescens (Gyel.) Brodo & Hawks.	USNEACEAE	Old Man's Beard
CETRHAL	Cetraria halei W.Culb. & C.Culb.	PARMELIACEAE	
CETRPIN	Cetraria pinastri (Scop.) S.Gray	PARMELIACEAE	
CLADCOR	Cladonia cornuta (L.) Hoffm.	CLADONIACEAE	Reindeer Lichen
CLADCRI	Cladonia crispata (Ach.) Flot.	CLADONIACEAE	Reindeer Lichen
CLADGRA	Cladonia gracilis (L.) Willd.	CLADONIACEAE	Reindeer Lichen
CLADMIT	Cladina mitis (Sandst.) Hale & W.Culb.	CLADONIACEAE	Reindeer Lichen
CLADRAN	Cladina rangiferina (L.) Harm.	CLADONIACEAE	Reindeer Lichen
EVERMES	Evernia mesomorpha Nyl.	USNEACEAE	
HYPOPHY	Hypogymnia physodes (L.) W. Wats	PARMELIACEAE	
ICMAERI	Icmadophila ericetorum (L.) Zahlbr.	LECANORACEAE	
NEPHRES	Nephroma resupinatum (L.) Ach.	NEPHROMATACEAE	
PARMFLA	Parmelia flaventior Stirt.	PARMELIACEAE	
PARMHYP	Parmeliopsis hyperopta (Ach.) Arn.	PARMELIACEAE	
PARMINF	Parmelia infumata Nyl.	PARMELIACEAE	
PARMSUL	Parmelia sulcata Tayl.	PARMELIACEAE	
PELTAPH	Peltigera aphthosa (L.) Willd.	PELTIGERACEAE	Studded Leather Lichen
PELTCAN	Peltigera canina (L.) Willd.	PELTIGERACEAE	Dog Lichen
PELTPOL	Peltigera polydactyla (Neck.) Hoffm.	PELTIGERACEAE	
PHYSADS	Physcia adscendens (Th. Fr.) Oliv.	PHYSCIACEAE	
RAMAFAR	Ramalina farinacea (L.) Ach., B	RAMALINACEAE	
USNEALP	Usnea alpina Mot.	USNEACEAE	Old Man's Beard
USNESOR	Usnea sorediifera (Arn.) Lynge	USNEACEAE	Old Man's Beard
XANTFAL	Xanthoria fallax (Hepp) Arn.	TELOSCHISTACEAE	
XANTPOL	Xanthoria polycarpa (Ehrh.) Oliv.	TELOSCHISTACEAE	

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MENSURATION SUMMARY
08:07:04 JUN 20, 1986

MERCHANTABILITY LIMITS:
STUMP HEIGHT (M):0.3
BREAST HEIGHT (M):1.3
TOP DIAMETER IB (CM):7.0

VOLUME SAMPLING REGION : 6

VOLUME SAMPLING REGION COEFFICIENTS FOR : SW

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000440	1.8913879	1.0183563	0.3636119	-0.1316804	0.7645595

VOLUME SAMPLING REGION COEFFICIENTS FOR : SB

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000535	1.7828674	1.0353346	0.1992271	0.2144730	0.5572933

VOLUME SAMPLING REGION COEFFICIENTS FOR : SE

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000440	1.8913879	1.0183563	0.3636119	-0.1316804	0.7645595

VOLUME SAMPLING REGION COEFFICIENTS FOR : PL

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000389	1.9143143	1.0716181	-0.0293341	1.0738201	-0.0640530

VOLUME SAMPLING REGION COEFFICIENTS FOR : PJ

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000389	1.9143143	1.0716181	-0.0293341	1.0738201	-0.0640530

VOLUME SAMPLING REGION COEFFICIENTS FOR : FA

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000323	2.0358601	0.9658680	-0.1972612	1.4338284	-0.2391706

VOLUME SAMPLING REGION COEFFICIENTS FOR : FB

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000323	2.0358601	0.9658680	-0.1972612	1.4338284	-0.2391706

VOLUME SAMPLING REGION COEFFICIENTS FOR : LA

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000535	1.7828674	1.0353346	0.1992271	0.2144730	0.5572933

VOLUME SAMPLING REGION COEFFICIENTS FOR : LT

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000535	1.7828674	1.0353346	0.1992271	0.2144730	0.5572933

VOLUME SAMPLING REGION COEFFICIENTS FOR : FD

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000247	1.9723911	1.0826426	-0.3329863	1.6803684	-0.3645858

VOLUME SAMPLING REGION COEFFICIENTS FOR : AW

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000386	1.9391947	1.0270700	0.1048042	0.6730628	0.2201650

VOLUME SAMPLING REGION COEFFICIENTS FOR : PB

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000386	1.9391947	1.0270700	0.1048042	0.6730628	0.2201650

VOLUME SAMPLING REGION COEFFICIENTS FOR : BW

TOTAL VOLUME COEFFICIENTS A	B	C	MERCHANTABLE VOLUME COEFFICIENTS		
0.0000219	1.8975706	1.2631187	0.1082491	0.8583470	0.0021549

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ASSOCIATION SUMMARY - POPULUS TREMULOIDES/SHEPHERDIA

	TOTAL GROSS VOLUME				MERCHANTABLE GROSS VOLUME				SITE INDEX M@50YR				SAMPLE
	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	TREES
VOLUME (M3/HA)													
TOTAL	165.97	123.89	246.15	69.47	150.97	108.07	231.34	69.66					
CONIFEROUS													
DECIDUOUS	165.97	123.89	246.15	69.47	150.97	108.07	231.34	69.66					
SPECIES VOLUME (M3/HA)													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	165.40	122.18	246.15	69.99	150.97	108.07	231.34	69.66	16.03	14.51	17.91	1.73	5.
PB													
BW	0.57		1.71	0.99									
LIVE STEMS/HA													
CONIFEROUS													
DECIDUOUS	863.90	800.00	966.70	89.90									
TOTAL	863.90	800.00	966.70	89.90									
BASAL AREA (M2/HA)													
CONIFEROUS													
DECIDUOUS	22.77	17.70	30.40	6.73									
TOTAL	22.77	17.70	30.40	6.73									
M.A.I. (M3/HA/YR)	2.42	1.95	3.12	0.62	2.21	1.65	2.93	0.66					
STAND AGE (YEARS)	66.7	55.5	79.0	11.8									
CANOPY HEIGHT (M)	15.2	13.2	17.5	2.2									
HGT DOM+CODOM (M)	17.4	15.8	19.0	1.6									
MEAN DBH (CM)	17.7	15.6	21.0	2.9									

University of Alberta

PLOT SUMMARY - ASSOCIATION : POPULUS TREMULOIDES/SHEPHERDIA

PLOT NUMBER	5KW017	5KW033	5KW056										
TOTAL VOL/HA	246.15	123.89	127.86										
CONIFER													
DECID	246.15	123.89	127.86										
SPECIES VOL/HA													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	246.15	122.18	127.86										
PB													
BW		1.71											
SI @50 YEARS													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	15.66	17.91	14.51										
PB													
BW													
LIVE TREES TOT	825.00	800.00	966.70										
CONIFER													
DECID	825.00	800.00	966.70										
M.A.I. TOT VOL	3.12	2.20	1.95										
STAND AGE	79.0	55.5	65.5										
CANOPY HEIGHT	17.5	14.9	13.2										
HTD DOM+CODOM	19.0	17.3	15.8										
MEAN DIAMETER	21.0	16.4	15.6										

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ASSOCIATION SUMMARY - POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, CALAMAGROSTIS PHASE

	TOTAL GROSS VOLUME				MERCHANTABLE GROSS VOLUME				SITE INDEX M@50YR				SAMPLE
	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	TREES
VOLUME (M3/HA)													
TOTAL	216.18	95.24	410.67	93.91	153.49	6.69	371.52	119.83					
CONIFEROUS	8.03		85.94	25.85	7.67		82.30	24.76					
DECIDUOUS	208.15	95.24	410.67	88.78	145.82	6.69	371.52	113.64					
SPECIES VOLUME (M3/HA)													
SW	8.03		85.94	25.85	7.67		82.30	24.76	20.31	20.31	20.31		1.
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	204.25	95.24	410.67	88.89	143.29	6.69	371.52	114.15	18.57	14.06	24.20	3.26	21.
PB	3.49		32.53	9.79	2.53		25.16	7.55	21.23	21.23	21.23		1.
BW	0.41		2.71	0.94									
LIVE STEMS/HA													
CONIFEROUS	12.12		100.00	30.81									
DECIDUOUS	1958.34	275.00	3500.00	901.16									
TOTAL	1970.45	275.00	3500.00	891.41									
BASAL AREA (M2/HA)													
CONIFEROUS	0.91		9.50	2.85									
DECIDUOUS	28.26	18.40	48.00	8.67									
TOTAL	29.17	18.40	48.00	9.23									
M.A.I. (M3/HA/YR)	3.84	2.35	5.55	1.17	2.42	0.17	4.82	1.54					
STAND AGE (YEARS)	59.1	33.0	136.0	31.1									
CANOPY HEIGHT (M)	14.3	11.1	20.1	2.6									
HGT DOM+CODOM (M)	17.3	12.3	24.1	3.7									
MEAN DBH (CM)	14.5	9.6	28.5	5.6									

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PLOT SUMMARY - ASSOCIATION : POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, CALAMAGROSTIS PHASE

PLOT NUMBER	5KW053	5KW030	5KW031	5KW021	5KW026	5KW054	5KW024	5KW007	5KW049	5KW050	5KW004		
TOTAL VOL/HA	231.56	262.63	308.13	270.63	146.91	106.31	410.67	95.24	167.12	164.73	214.01		
CONIFER			85.94	2.39									
DECID	231.56	262.63	222.18	268.24	146.91	106.31	410.67	95.24	167.12	164.73	214.01		
SPECIES VOL/HA													
SW			85.94	2.39									
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	225.76	259.93	222.18	268.24	145.10	106.31	410.67	95.24	167.12	164.73	181.47		
PB	5.81												
BW		2.71			1.82						32.53		
SI M*50 YEARS													
SW			20.31										
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	14.35	19.59	17.07	24.20	22.22	16.72	14.06	18.93	16.29	18.92	21.92		
PB											21.23		
BW													
LIVE TREES TOT	275.00	2500.00	1500.00	900.00	2400.00	2400.00	1400.00	2000.00	2300.00	3500.00	2500.00		
CONIFER			100.00	33.30									
DECID	275.00	2500.00	1400.00	866.70	2400.00	2400.00	1400.00	2000.00	2300.00	3500.00	2500.00		
M.A.I. TOT VOL	2.35	5.53	5.40	4.00	3.72	2.66	3.02	2.89	3.25	3.88	5.55		
STAND AGE	96.0	47.0	59.0	67.0	39.0	40.0	136.0	33.0	51.5	42.5	39.3		
CANOPY HEIGHT	20.1	14.5	16.6	16.5	13.8	11.7	14.3	11.1	12.3	12.5	14.2		
HTD DOM+CODOM	19.6	16.9	18.2	24.1	17.3	12.4	22.3	12.3	15.0	15.1	16.9		
MEAN DIAMETER	28.5	13.6	17.1	18.0	10.5	10.0	17.7	10.6	11.6	9.6	12.1		

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ASSOCIATION SUMMARY - POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, ARALIA PHASE

	TOTAL GROSS VOLUME				MERCHANTABLE GROSS VOLUME				SITE INDEX M@50YR				SAMPLE
	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	TREES
VOLUME (M3/HA)													
TOTAL	248.93	148.88	391.15	84.01	187.99	17.23	357.58	120.36					
CONIFEROUS													
DECIDUOUS	248.93	148.88	391.15	84.01	187.99	17.23	357.58	120.36					
SPECIES VOLUME (M3/HA)													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	238.24	116.18	391.15	93.26	184.12	17.23	357.58	123.17	20.01	17.47	23.68	2.24	20.
PB	6.94		48.67	15.29	3.87		30.37	9.67	20.98	20.98	20.98		1.
BW	3.75		37.52	11.86					15.13	15.13	15.13		2.
LIVE STEMS/HA													
CONIFEROUS													
DECIDUOUS	2098.33	933.30	3600.00	855.94									
TOTAL	2098.33	933.30	3600.00	855.94									
BASAL AREA (M2/HA)													
CONIFEROUS													
DECIDUOUS	32.43	22.90	47.80	7.48									
TOTAL	32.43	22.90	47.80	7.48									
M.A.I. (M3/HA/YR)	4.81	3.50	7.45	1.07	3.38	0.51	6.81	1.81					
STAND AGE (YEARS)	50.9	33.7	73.0	14.9									
CANOPY HEIGHT (M)	16.2	11.8	20.5	2.8									
HGT DOM+CODOM (M)	17.7	12.1	21.7	3.2									
MEAN DBH (CM)	14.7	9.8	20.2	4.2									

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PLOT SUMMARY - ASSOCIATION : POPULUS TREMULOIDES/VIBURNUM EDULE-ROSA, ARALIA PHASE

PLOT NUMBER	5KW001	5KW012	5KW005	5KW043	5KW002	5KW003	5KW006	5KW011	5KW038	5KW039			
TOTAL VOL/HA	348.38	275.39	225.77	287.43	287.53	217.72	153.35	153.70	148.88	391.15			
CONIFER													
DECID	348.38	275.39	225.77	287.43	287.53	217.72	153.35	153.70	148.88	391.15			
SPECIES VOL/HA													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	348.38	275.39	177.10	287.43	287.53	206.49	143.86	116.18	148.88	391.15			
PB			48.67			11.24	9.49						
BW								37.52					
SI M=50 YEARS													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	18.01	20.63	23.68	18.12	17.47	21.74	22.15	18.35	18.12	21.83			
PB							20.98						
BW								15.13					
LIVE TREES TOT	1150.00	933.30	2600.00	1000.00	2100.00	2600.00	2700.00	3600.00	2200.00	2100.00			
CONIFER													
DECID	1150.00	933.30	2600.00	1000.00	2100.00	2600.00	2700.00	3600.00	2200.00	2100.00			
M.A.I. TOT VOL	4.77	4.41	4.79	4.11	4.64	5.58	4.57	4.30	3.50	7.45			
STAND AGE	73.0	62.5	37.0	70.0	62.0	37.0	33.7	39.3	42.5	52.5			
CANOPY HEIGHT	19.4	20.5	15.4	18.2	17.1	14.1	13.7	11.8	14.1	17.6			
HTD DOM+CODOM	20.8	21.7	17.7	20.3	18.2	16.2	14.9	12.1	14.3	20.6			
MEAN DIAMETER	20.2	19.7	12.1	20.2	14.8	12.0	10.2	9.8	11.3	16.7			

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ASSOCIATION SUMMARY - POPULUS TREMULOIDES-P. BALSAMIFERA/VIBURNUM EDULE-ROSA

	TOTAL GROSS VOLUME MEAN	MIN	MAX	S.D.	MERCHANTABLE GROSS VOLUME MEAN	MIN	MAX	S.D.	SITE INDEX M*50YR MEAN	MIN	MAX	S.D.	SAMPLE TREES
VOLUME (M3/HA)													
TOTAL	157.14	110.47	241.46	49.48	59.14	17.09	112.37	36.16					
CONIFEROUS													
DECIDUOUS	157.14	110.47	241.46	49.48	59.14	17.09	112.37	36.16					
SPECIES VOLUME (M3/HA)													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	94.53	37.56	145.73	37.63	33.85		64.01	22.00	20.51	18.04	22.83	1.60	11.
PB	62.61	33.38	95.73	24.48	25.29	5.61	48.35	16.67	18.82	16.54	20.35	1.49	11.
BW													
LIVE STEMS/HA													
CONIFEROUS													
DECIDUOUS	2600.00	1400.00	3100.00	632.46									
TOTAL	2600.00	1400.00	3100.00	632.46									
BASAL AREA (M2/HA)													
CONIFEROUS													
DECIDUOUS	24.88	18.20	35.80	6.65									
TOTAL	24.88	18.20	35.80	6.65									
M.A.I. (M3/HA/YR)	4.05	3.13	5.69	1.01	1.47	0.50	2.63	0.78					
STAND AGE (YEARS)	39.3	34.3	44.8	4.6									
CANOPY HEIGHT (M)	13.3	11.5	14.5	1.0									
HGT DOM+CODOM (M)	14.6	12.9	15.6	1.0									
MEAN DBH (CM)	10.8	9.4	12.4	1.1									

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PLOT SUMMARY - ASSOCIATION : POPULUS TREMULOIDES-P. BALSAMIFERA/VIBURNUM EDULE-ROSA

PLOT NUMBER	5KW008	5KW018	5KW051	5KW036	5KW034	5KW047							
TOTAL VOL/HA	110.47	119.62	125.21	176.12	241.46	169.95							
CONIFER													
DECID	110.47	119.62	125.21	176.12	241.46	169.95							
SPECIES VOL/HA													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	37.56	74.80	91.83	94.17	145.73	123.09							
PB	72.92	44.81	33.38	81.95	95.73	46.85							
BW													
SI M@50 YEARS													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	20.79	22.83	20.42	18.04	19.72	21.27							
PB	20.35	16.54	19.44	18.32	17.96	20.31							
BW													
LIVE TREES TOT	2500.00	2700.00	1400.00	3100.00	3100.00	2800.00							
CONIFER													
DECID	2500.00	2700.00	1400.00	3100.00	3100.00	2800.00							
M.A.I. TOT VOL	3.23	3.50	3.13	3.95	5.69	4.83							
STAND AGE	34.3	36.3	41.0	44.8	44.0	35.3							
CANOPY HEIGHT	12.9	11.5	13.8	13.1	14.5	13.8							
HTD DOM+CODOM	14.0	12.9	15.6	15.0	15.4	14.9							
MEAN DIAMETER	9.4	10.0	12.4	10.5	11.9	10.7							

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ASSOCIATION SUMMARY - POPULUS TREMULOIDES-P.BALSAMIFERA/ALNUS/EPILOBIUM-CALAMAGROSTI

	TOTAL GROSS VOLUME				MERCHANTABLE GROSS VOLUME				SITE INDEX M@50YR				SAMPLE
	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	TREES
VOLUME (M3/HA)													
TOTAL	297.60	115.03	411.67	131.09	286.48	103.12	399.95	131.24					
CONIFEROUS	25.85		101.62	50.52	25.03		98.63	49.07					
DECIDUOUS	271.74	113.25	411.67	122.76	261.45	101.61	399.95	122.83					
SPECIES VOLUME (M3/HA)													
SW													
SB	25.85		101.62	50.52	25.03		98.63	49.07	17.66	17.66	17.66		1.
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	89.80		204.76	88.56	85.73		199.00	87.11	20.60	19.47	21.72	1.59	4.
PB	181.95	67.13	268.08	84.14	175.71	62.87	259.77	82.56	19.03	18.02	21.02	1.72	5.
BW													
LIVE STEMS/HA													
CONIFEROUS	12.50		25.00	14.43									
DECIDUOUS	318.75	250.00	425.00	74.65									
TOTAL	331.25	275.00	450.00	80.04									
BASAL AREA (M2/HA)													
CONIFEROUS	2.17		8.30	4.09									
DECIDUOUS	26.32	13.60	36.70	9.64									
TOTAL	28.52	14.00	36.70	10.16									
M.A.I. (M3/HA/YR)	2.39	0.72	3.86	1.48	2.30	0.61	3.74	1.47					
STAND AGE (YEARS)	101.1	64.0	119.7	25.5									
CANOPY HEIGHT (M)	20.8	13.7	25.3	5.2									
HGT DOM+CODOM (M)	25.8	21.5	28.0	3.0									
MEAN DBH (CM)	31.5	16.8	38.6	10.1									

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PLOT SUMMARY - ASSOCIATION : POPULUS TREMULOIDES-P.BALSAMIFERA/ALNUS/EPILOBIUM-CALAMAGROSTI

PLOT NUMBER	5KW016	5KW015	5KW046	5KW010									
TOTAL VOL/HA	115.03	369.71	411.67	293.98									
CONIFER	1.79	101.62											
DECID	113.25	268.08	411.67	293.98									
SPECIES VOL/HA													
SW	1.79	101.62											
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	46.12		204.76	108.31									
PB	67.13	268.08	206.91	185.67									
BW													
SI M=50 YEARS													
SW		17.66											
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	21.72		19.47										
PB		21.02	18.02	18.05									
BW													
LIVE TREES TOT	450.00	275.00	300.00	300.00									
CONIFER	25.00	25.00											
DECID	425.00	250.00	300.00	300.00									
M.A.I. TOT VOL	0.72	3.86	3.40	1.60									
STAND AGE	64.0	104.7	119.7	116.0									
CANOPY HEIGHT	13.7	23.8	25.3	20.2									
HTD DOM+CODOM	21.5	28.0	27.5	26.1									
MEAN DIAMETER	16.8	37.8	38.6	32.7									

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ASSOCIATION SUMMARY - POPULUS BALSAMIFERA/CORNUS STOLONIFERA

	TOTAL GROSS VOLUME MEAN	MIN	MAX	S.D.	MERCHANTABLE GROSS VOLUME MEAN	MIN	MAX	S.D.	SITE INDEX M@50YR MEAN	MIN	MAX	S.D.	SAMPLE TREES
VOLUME (M3/HA)													
TOTAL	314.11	314.11	314.11		303.35	303.35	303.35						
CONIFEROUS													
DECIDUOUS	314.11	314.11	314.11		303.35	303.35	303.35						
SPECIES VOLUME (M3/HA)													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	24.26	24.26	24.26		23.26	23.26	23.26		18.31	18.31	18.31		2.
PB	289.85	289.85	289.85		280.09	280.09	280.09		20.45	20.45	20.45		2.
BW													
LIVE STEMS/HA													
CONIFEROUS													
DECIDUOUS	425.00	425.00	425.00										
TOTAL	425.00	425.00	425.00										
BASAL AREA (M2/HA)													
CONIFEROUS													
DECIDUOUS	32.20	32.20	32.20										
TOTAL	32.20	32.20	32.20										
M.A.I. (M3/HA/YR)	4.03	4.03	4.03		3.90	3.90	3.90						
STAND AGE (YEARS)	71.0	71.0	71.0										
CANOPY HEIGHT (M)	21.6	21.6	21.6										
HGT DOM+CODOM (M)	21.8	21.8	21.8										
MEAN DBH (CM)	30.5	30.5	30.5										

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PLOT SUMMARY - ASSOCIATION : POPULUS BALSAMIFERA/CORNUS STOLONIFERA

PLOT NUMBER	5KW052													
TOTAL VOL/HA	314.11													
CONIFER														
DECID	314.11													
SPECIES VOL/HA														
SW														
SB														
SE														
PL														
PJ														
FA														
FB														
LA														
LT														
FD														
AW	24.26													
PB	289.85													
BW														
SI @50 YEARS														
SW														
SB														
SE														
PL														
PJ														
FA														
FB														
LA														
LT														
FD														
AW	18.31													
PB	20.45													
BW														
LIVE TREES TOT	425.00													
CONIFER														
DECID	425.00													
M.A.I. TOT VOL	4.03													
STAND AGE	71.0													
CANOPY HEIGHT	21.6													
HTD DOM+CODOM	21.8													
MEAN DIAMETER	30.5													

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ASSOCIATION SUMMARY - PICEA GLAUCA-P. TREMULOIDES/VIBURNUM EDULE-ROSA

	TOTAL GROSS VOLUME				MERCHANTABLE GROSS VOLUME				SITE INDEX M@50YR				SAMPLE
	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	TREES
VOLUME (M3/HA)													
TOTAL	356.33	262.32	464.57	70.26	336.08	241.23	441.79	69.78					
CONIFEROUS	243.55	135.14	395.89	108.50	229.05	127.96	375.35	102.93					
DECIDUOUS	112.78	17.77	212.72	77.37	107.03	16.90	206.67	76.68					
SPECIES VOLUME (M3/HA)													
SW	243.55	135.14	395.89	108.50	229.05	127.96	375.35	102.93	16.68	12.83	19.14	2.26	13.
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	110.07	16.01	212.72	80.17	104.52	15.40	206.67	79.46	16.85	16.00	19.11	1.51	5.
PB	1.99		11.94	4.87	1.90		11.38	4.65	14.64	14.64	14.64		1.
BW	0.72		1.76	0.82	0.61		1.50	0.71					
LIVE STEMS/HA													
CONIFEROUS	481.95	150.00	766.70	265.44									
DECIDUOUS	237.50	66.70	433.30	149.59									
TOTAL	719.43	350.00	1100.00	247.97									
BASAL AREA (M2/HA)													
CONIFEROUS	2	13.00	37.50	9.89									
DECIDUOUS	1	2.00	18.10	6.56									
TOTAL	3	29.50	44.30	6.29									
M.A.I. (M3/HA/YR)	3	2.39	4.09	0.65	2.98	2.30	3.89	0.61					
STAND AGE (YEARS)	109.7	83.8	131.5	20.7									
CANOPY HEIGHT (M)	19.1	14.3	24.2	3.8									
HGT DOM+CODOM (M)	24.8	21.3	28.4	2.6									
MEAN DBH (CM)	24.4	18.0	32.3	5.2									

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PLOT SUMMARY - ASSOCIATION : PICEA GLAUCA-P. TREMULOIDES/VIBURNUM EDULE-ROSA

PLOT NUMBER	5KW028	5KW029	5KW009	5KW055	5KW022	5KW027							
TOTAL VOL/HA	372.23	387.77	464.57	262.32	303.25	347.86							
CONIFER	354.46	221.15	395.89	211.47	143.19	135.14							
DECID	17.77	166.62	68.69	50.85	160.06	212.72							
SPECIES VOL/HA													
SW	354.46	221.15	395.89	211.47	143.19	135.14							
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	16.01	166.62	67.14	37.90	160.06	212.72							
PB				11.94									
BW	1.76		1.54	1.01									
SI M@50 YEARS													
SW	12.83	19.14	17.19	17.33	18.19	15.38							
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW		16.20	16.00		16.10	19.11							
PB				14.64									
BW													
LIVE TREES TOT	833.30	750.00	650.00	633.30	1100.00	350.00							
CONIFER	766.70	450.00	575.00	200.00	750.00	150.00							
DECID	66.70	300.00	75.00	433.30	350.00	200.00							
M.A.I. TOT VOL	2.70	3.63	4.09	2.39	3.34	2.75							
STAND AGE	131.5	105.7	117.5	88.3	83.8	131.3							
CANOPY HEIGHT	18.6	20.1	22.0	15.2	14.3	24.2							
HTD DOM+CODOM	24.6	26.4	25.6	22.3	21.3	28.4							
MEAN DIAMETER	22.5	26.0	27.4	20.1	18.0	32.3							

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ASSOCIATION SUMMARY - PICEA GLAUCA/VIBURNUM-ROSA/HYLOCOMIUM-PLEUROZIUM

	TOTAL GROSS VOLUME				MERCHANTABLE GROSS VOLUME				SITE INDEX M@50YR				SAMPLE
	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	TREES
VOLUME (M3/HA)													
TOTAL	405.68	180.81	594.33	138.98	382.10	160.00	565.94	136.91					
CONIFEROUS	372.63	176.65	444.58	106.64	351.27	160.00	421.51	104.03					
DECIDUOUS	33.06		149.75	58.36	30.83		144.43	56.88					
SPECIES VOLUME (M3/HA)													
SW	372.63	176.65	444.58	106.64	351.27	160.00	421.51	104.03	16.33	11.71	21.56	3.17	13.
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	32.36		149.75	58.80	30.83		144.43	56.88	16.95	16.95	16.95		1.
PB													
BW	0.69		4.16	1.70									
LIVE STEMS/HA													
CONIFEROUS	827.77	500.00	1150.00	236.34									
DECIDUOUS	84.73		250.00	102.26									
TOTAL	912.50	525.00	1150.00	228.99									
BASAL AREA (M2/HA)													
CONIFEROUS	39.43	22.60	47.70	9.26									
DECIDUOUS	3.47		14.80	5.68									
TOTAL	42.90	23.60	58.60	11.75									
M.A.I. (M3/HA/YR)	3.95	1.44	4.95	1.30	3.73	1.30	4.64	1.26					
STAND AGE (YEARS)	102.8	86.5	131.3	19.3									
CANOPY HEIGHT (M)	19.3	15.1	22.8	2.9									
HGT DOM+CODOM (M)	24.4	21.0	29.6	3.4									
MEAN DBH (CM)	23.1	17.7	31.4	4.8									

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PLOT SUMMARY - ASSOCIATION : PICEA GLAUCA/VIBURNUM-ROSA/HYLOCOMIUM-PLEUROZIUM

PLOT NUMBER	5KW019	5KW032	5KW035	5KW013	5KW045	5KW048							
TOTAL VOL/HA	180.81	426.73	594.33	428.27	470.70	333.26							
CONIFER	176.65	426.73	444.58	428.27	439.56	319.96							
DECID	4.16		149.75		31.14	13.30							
SPECIES VOL/HA													
SW	176.65	426.73	444.58	428.27	439.56	319.96							
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW			149.75		31.14	13.30							
PB													
BW	4.16												
SI M*SO YEARS													
SW	11.71	16.68	15.38	15.78	21.56	16.90							
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW			16.95										
PB													
BW													
LIVE TREES TOT	800.00	1000.00	1100.00	1150.00	525.00	900.00							
CONIFER	633.30	1000.00	850.00	1150.00	500.00	833.30							
DECID	166.70		250.00		25.00	66.70							
M.A.I. TOT VOL	1.44	4.54	4.49	4.95	4.60	3.68							
STAND AGE	122.7	94.0	131.3	86.5	95.5	87.0							
CANOPY HEIGHT	15.1	19.5	22.3	17.2	22.8	19.2							
HTD DOM+CODOM	21.7	23.9	27.4	21.0	29.6	22.6							
MEAN DIAMETER	17.7	23.4	25.1	19.5	31.4	21.8							

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ASSOCIATION SUMMARY - SALIX/CAREX-CALAMAGROSTIS

	TOTAL GROSS VOLUME MEAN	MIN	MAX	S.D.	MERCHANTABLE GROSS VOLUME MEAN	MIN	MAX	S.D.	SITE INDEX M@50YR MEAN	MIN	MAX	S.D.	SAMPLE TREES
VOLUME (M3/HA)													
TOTAL													
CONIFEROUS													
DECIDUOUS													
SPECIES VOLUME (M3/HA)													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW													
PB													
BW													
LIVE STEMS/HA													
CONIFEROUS													
DECIDUOUS													
TOTAL													
BASAL AREA (M2/HA)													
CONIFEROUS													
DECIDUOUS													
TOTAL													
M.A.I. (M3/HA/YR)													
STAND AGE (YEARS)													
CANOPY HEIGHT (M)													
HGT DOM+CODOM (M)													
MEAN DBH (CM)													

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PLOT SUMMARY - ASSOCIATION : SALIX/CAREX-CALAMAGROSTIS

PLOT NUMBER													
TOTAL VOL/HA													
CONIFER													
DECID													
SPECIES VOL/HA													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW													
PB													
BW													
SI @50 YEARS													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW													
PB													
BW													
LIVE TREES TOT													
CONIFER													
DECID													
M.A.I. TOT VOL													
STAND AGE													
CANOPY HEIGHT													
HTD DOM+CODOM													
MEAN DIAMETER													

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ASSOCIATION SUMMARY - LARIX LARICINA/CAREX AQUATILIS

	TOTAL GROSS VOLUME MEAN	MIN	MAX	S.D.	MERCHANTABLE GROSS VOLUME MEAN	MIN	MAX	S.D.	SITE INDEX M@50YR MEAN	MIN	MAX	S.D.	SAMPLE TREES
VOLUME (M3/HA)													
TOTAL	29.76	29.76	29.76		5.23	5.23	5.23						
CONIFEROUS	27.31	27.31	27.31		5.23	5.23	5.23						
DECIDUOUS	2.46	2.46	2.46										
SPECIES VOLUME (M3/HA)													
SW													
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT	27.31	27.31	27.31		5.23	5.23	5.23		14.09	14.09	14.09		2.
FD													
AW													
PB													
BW	2.46	2.46	2.46										
LIVE STEMS/HA													
CONIFEROUS	825.00	825.00	825.00										
DECIDUOUS	150.00	150.00	150.00										
TOTAL	975.00	975.00	975.00										
BASAL AREA (M2/HA)													
CONIFEROUS	6.70	6.70	6.70										
DECIDUOUS	0.80	0.80	0.80										
TOTAL	7.50	7.50	7.50										
M.A.I. (M3/HA/YR)	0.55	0.55	0.55		0.10	0.10	0.10						
STAND AGE (YEARS)	50.0	50.0	50.0										
CANOPY HEIGHT (M)	8.8	8.8	8.8										
HGT DOM+CODOM (M)	11.1	11.1	11.1										
MEAN DBH (CM)	9.6	9.6	9.6										

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PLOT SUMMARY - ASSOCIATION : LARIX LARICINA/CAREX AQUATILIS

PLOT NUMBER	5KW057
TOTAL VOL/HA	29.76
CONIFER	27.31
DECID	2.46
SPECIES VOL/HA	
SW	
SB	
SE	
PL	
PJ	
FA	
FB	
LA	
LT	27.31
FD	
AW	
PB	
BW	2.46
SI M=50 YEARS	
SW	
SB	
SE	
PL	
PJ	
FA	
FB	
LA	
LT	14.09
FD	
AW	
PB	
BW	
LIVE TREES TOT	975.00
CONIFER	825.00
DECID	150.00
M.A.I. TOT VOL	0.55
STAND AGE	50.0
CANOPY HEIGHT	8.8
HTD DOM+CODOM	11.1
MEAN DIAMETER	9.6

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ASSOCIATION SUMMARY - PICEA MARIANA/LEDUM GROENLANDICUM/SPHAGNUM

	TOTAL GROSS VOLUME MEAN	MIN	MAX	S.D.	MERCHANTABLE GROSS VOLUME MEAN	MIN	MAX	S.D.	SITE INDEX M@50YR MEAN	MIN	MAX	S.D.	SAMPLE TREES
VOLUME (M3/HA)													
TOTAL	13.17	4.25	22.08	12.61	2.97		5.95	4.21					
CONIFEROUS	13.17	4.25	22.08	12.61	2.97		5.95	4.21					
DECIDUOUS													
SPECIES VOLUME (M3/HA)													
SW													
SB	13.17	4.25	22.08	12.61	2.97		5.95	4.21	6.66	4.47	8.85	3.10	4.
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW													
PB													
BW													
LIVE STEMS/HA													
CONIFEROUS	450.00	225.00	675.00	318.20									
DECIDUOUS													
TOTAL	450.00	225.00	675.00	318.20									
BASAL AREA (M2/HA)													
CONIFEROUS	3.80	1.40	6.20	3.39									
DECIDUOUS													
TOTAL	3.80	1.40	6.20	3.39									
M.A.I. (M3/HA/YR)	0.13	0.08	0.17	0.06	0.02		0.04	0.03					
STAND AGE (YEARS)	93.5	53.5	133.5	56.6									
CANOPY HEIGHT (M)	7.0	6.4	7.7	0.9									
HGT DOM+CODOM (M)	7.5	6.5	8.5	1.4									
MEAN DBH (CM)	9.8	9.0	10.5	1.1									

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PLOT SUMMARY - ASSOCIATION : PICEA MARIANA/LEDUM GROENLANDICUM/SPHAGNUM

PLOT NUMBER	5KW025	5KW040											
TOTAL VOL/HA	22.08	4.25											
CONIFER	22.08	4.25											
DECID													
SPECIES VOL/HA													
SW													
SB	22.08	4.25											
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW													
PB													
BW													
SI M=50 YEARS													
SW													
SB	4.47	8.85											
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW													
PB													
BW													
LIVE TREES TOT	675.00	225.00											
CONIFER	675.00	225.00											
DECID													
M.A.I. TOT VOL	0.17	0.08											
STAND AGE	133.5	53.5											
CANOPY HEIGHT	7.7	6.4											
HTD DOM+CODOM	8.5	6.5											
MEAN DIAMETER	10.5	9.0											

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ASSOCIATION SUMMARY - DISTURBED STANDS

	TOTAL GROSS VOLUME				MERCHANTABLE GROSS VOLUME				SITE INDEX M@50YR				SAMPLE
	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	MEAN	MIN	MAX	S.D.	TREES
VOLUME (M3/HA)													
TOTAL	215.78	90.42	327.71	113.49	175.67		301.66	135.44					
CONIFEROUS	88.88		208.57	104.20	83.64		201.19	99.98					
DECIDUOUS	126.90	85.73	183.96	47.28	92.04		169.41	77.17					
SPECIES VOLUME (M3/HA)													
SW	88.88		208.57	104.20	83.64		201.19	99.98	13.55	11.94	15.16	2.28	4.
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	121.56	78.90	179.03	48.40	91.23		167.73	76.28	22.86	18.75	27.21	4.24	4.
PB	3.72		11.52	5.44	0.39		1.56	0.78	15.59	15.59	15.59		2.
BW	1.61		4.92	2.32	0.42		1.68	0.84					
LIVE STEMS/HA													
CONIFEROUS	145.83		333.30	139.68									
DECIDUOUS	885.42	225.00	2100.00	837.66									
TOTAL	1031.25	325.00	2100.00	755.36									
BASAL AREA (M2/HA)													
CONIFEROUS	9.07		19.50	10.07									
DECIDUOUS	13.65	10.70	15.50	2.25									
TOTAL	22.72	14.00	31.40	9.35									
M.A.I. (M3/HA/YR)	2.02	1.46	2.61	0.55	1.35		2.43	1.01					
STAND AGE (YEARS)	98.4	39.3	128.3	41.7									
CANOPY HEIGHT (M)	15.8	12.7	18.8	2.5									
HGT DOM+CODOM (M)	25.3	12.7	35.0	9.3									
MEAN DBH (CM)	16.2	9.6	19.6	4.5									

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PLOT SUMMARY - ASSOCIATION : DISTURBED STANDS

PLOT NUMBER	5KW014	5KW020	5KW041	5KW042									
TOTAL VOL/HA	150.72	90.42	327.71	294.29									
CONIFER	3.21		143.75	208.57									
DECID	147.51	90.42	183.96	85.73									
SPECIES VOL/HA													
SW	3.21		143.75	208.57									
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	144.13	78.90	179.03	84.19									
PB	3.38	11.52											
BW			4.92	1.53									
SI @50 YEARS													
SW			11.94	15.16									
SB													
SE													
PL													
PJ													
FA													
FB													
LA													
LT													
FD													
AW	27.21	18.75	22.62										
PB		15.59											
BW													
LIVE TREES TOT	325.00	2100.00	800.00	900.00									
CONIFER	100.00		333.30	150.00									
DECID	225.00	2100.00	466.70	750.00									
M.A.I. TOT VOL	1.46	2.36	2.61	1.64									
STAND AGE	99.0	39.3	128.3	127.0									
CANOPY HEIGHT	15.7	12.7	15.9	18.8									
HTD DOM+CODOM	35.0	12.7	26.3	27.2									
MEAN DIAMETER	19.6	9.6	17.8	17.8									

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MAPS NOT

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CARTES

OMISES